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Airborne Lidar Measurements of El Chichon Stratospheric Aerosols

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Preface

This is the fourth in a series of reports presenting results from five extensive lidar flight missions. One of the primary purposes of these missions was to determine the spatial distribution and aerosol characteristics of the El Chichon-produced stratospheric material. This particular mission covered latitudes between 72°N and 56°S in May 1983. Results from the first mission, which covered 42°N to 12°N, were reported in NASA Reference Publication 1166 entitled "Airborne Lidar Measurements of El Chichon Stratospheric Aerosols—July 1982." Results from the second mission, which covered 46°N to 46°S, were reported in NASA Reference Publication 1136 entitled "Airborne Lidar Measurements of El Chichon Stratospheric Aerosols—October 1982 to November 1982." Results from the third mission, which covered 27°N to 76°N, were reported in NASA Reference Publication 1148 entitled "Airborne Lidar Measurements of El Chichon Stratospheric Aerosols—January 1983 to February 1983." The fifth and remaining mission to be published took place in January 1984 and covered the latitudes 38°N to 90°N.

This report contains representative profiles of lidar backscatter ratio, plots of integrated backscattering values versus latitude, and contours of backscatter mixing ratio versus altitude and latitude. In addition, tables containing numerical values of the backscatter ratio and backscattering function versus altitude are supplied for each profile. Although no attempt has been made to provide any scientific analysis with the data, this report is intended to give the results of the mission in a ready-to-use format.

The authors recognize the airborne lidar team of W. H. Fuller, Jr., and B. R. Rouse of the NASA Langley Research Center and W. H. Hunt and F. C. Diehl of Wyle Laboratories, whose dedicated efforts provided these data. In addition, thanks go to the crew and supporting personnel at the NASA Ames Research Center for providing an excellent research airplane platform, a NASA Convair 990 (CV-990), for conducting these measurements. The authors also wish to express their appreciation to D. J. Hofmann and his group at the University of Wyoming for providing the dustsonde data.

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Summary

This report presents lidar data from a flight mission in May 1983 between latitudes of 72°N and 56°S. The primary purpose of this mission was to determine the spatial distribution and aerosol characteristics of the El Chichon-produced stratospheric material. Representative profiles of lidar backscatter ratio, plots of integrated backscattering values versus latitude, and contours of backscatter mixing ratio versus altitude and latitude are presented. In addition, tables containing numerical values of the backscatter ratio and the backscattering function versus altitude are supplied for each profile.

By May 1983, material produced by the El Chichon eruptions of late March-early April 1982 had spread throughout the latitudes of 72°N to 56°S. However, the most massive portion of the material measured by the flight resided north of 33°N and was concentrated below 21 km. In this latitude region (33°N to 72°N), peak backscatter ratios at a wavelength of 0.6943 μm varied between 3.5 and 4.5, and the peak integrated backscattering was about $18 \times 10^{-4} \mathrm{sr}^{-1}$, corresponding to a calculated peak optical depth of approximately 0.08. No attempt has been made in this report to give any detailed explanations or interpretations of the data. The report provides, in a ready-to-use format, the results of this mission to be used in atmospheric and climatic studies.

Introduction

The late March-early April 1982 eruptions of El Chichon in Mexico (17.3°N, 93.2°W) produced the largest enhancements of stratospheric aerosols in at least 20 years. Because of the effects of the eruption cloud from El Chichon and the need for characterizing the cloud spatially, a series of experimental survey flights was carried out to map its latitudinal and vertical distributions. Previous flights in July 1982 (ref. 1), October to November 1982 (ref. 2), and January to February 1983 (ref. 3) provided valuable information on the changes in spatial distribution and optical properties of the El Chichon aerosol over those periods of time. The primary purpose of the May 1983 flight was to provide additional information on these properties. A secondary purpose was to assist with the SAM II (Stratospheric Aerosol Measurement II) (ref. 4) correlative measurement program. To accomplish these goals, the NASA Convair 990 airplane, which was outfitted with a lidar system, a number of radiometers, a Brewer spectrophotometer, and a filter wedge spectrometer, was flown during the period from May 9 to May 21, 1983, between the latitudes of 72°N and 56°S. A simultaneous measurement rendezvous was accomplished between the airborne lidar instrument and satellite-borne SAM II instrument, providing excellent agreement between the two instruments.

This report presents the results of the lidar stratospheric measurements taken over the entire mission. Results of two sets of aerosol optical thickness measurements taken by multiwavelength solar radiometers have been reported by Spinhirne and King (ref. 5) and Shah and Evans (ref. 6).

Airborne Lidar System

The airborne lidar system used for the measurements presented in this report consists of a ruby laser, nominally emitting 1 joule per pulse at 1 pulse per 2 seconds at a wavelength (λ) of 0.6943 μm during flight, and a 35.6-cm cassegrainian-configured receiving telescope. Two photomultipliers, electronically switched on at specific times after laser firing, are used to enhance dynamic range. The photomultiplier output signals are processed with an analog-to-digital converter and microprocessor computer, stored on magnetic tape, and displayed on an interactive terminal. The transmitted output divergence is 1.0 mrad, and the receiver field-of-view is 2.0 mrad. Two 40.6-cm quartz windows separated by 1 m are used in the top of the fuselage of the airplane. One window is used for the laser transmitter, and the other, for the telescope receiver. The signal becomes usable at 3 to 4 km above the altitude of the airplane. A detailed error analysis for this system is described by Russell et al. (ref. 7).

Flight Path

The flight path for the May 1983 mission is given in figure 1. The northbound and southbound flight legs are represented by solid lines and dashed lines, respectively. Normally, the airborne lidar system must operate in darkness. However, under optimum conditions (no clouds, significant stratospheric loadings, and good normalization) data can be obtained for early morning to midmorning and midafternoon to late afternoon sun angles. Approximately one-half of the flight path shown in figure 1 was flown at night. As expected, overlying upper tropospheric clouds prevented measurement at some latitudes, but most latitudes were covered and a remarkable amount of high-quality data were successfully recorded. Table A1 (in the appendix) contains an abbreviated flight log for the mission and lists the date, time, location, and flight altitude for those legs of the mission in which good quality lidar data were obtained.

Lidar Profiles

The lidar backscatter ratio (or scattering ratio) is defined as

$$R(z) = 1 + \frac{f_A(z)}{f_M(z)} \qquad (1)$$

where f_A is the aerosol backscattering function, or scattering function, and f_M is the molecular backscattering function, both in units of $(\text{km-sr})^{-1}$ and both at altitude z (ref. 8). Representative vertical profiles of lidar scattering ratio for the flight survey are shown in figures 2 to 32. The error bars reflect the $1 - \sigma$ uncertainty in the derived scattering ratio. The tropopause height is indicated by an arrow. Tables A2 to A32 (in the appendix) contain numerical values of the aerosol scattering ratio and scattering function versus altitude for each of these profiles.

The scattering-ratio profiles, reported at 0.15-km intervals, have been smoothed over 0.3 km. The minimum five-point running average over a specified altitude range was computed for each profile. The profiles were then normalized to 1, a value that would be obtained only if no aerosols were present at some altitude within the normalization region. Occasionally, the numerical values of the scattering ratio are less than 1, and the corresponding scattering functions are negative. This occurs near the normalization height and when the profile contains minima outside the normalization region. Minimum values of the scattering ratio and scattering function should be considered 1 and 0, respectively.

As shown in figures 2 through 32, material produced by the El Chichon eruptions had spread throughout the latitudes between 72°N and 56°S. The first flight segment was from California to Alaska on May 9, 1983. During this flight leg, peak lidar backscatter ratios at $\lambda = 0.6943$ μm remained fairly constant while decreasing in altitude, varying between 3.8 at an altitude of 18.3 km at a latitude of 40°N, 3.7 at 18.2 km at 51°N, 3.9 at 16.5 km at 59°N, and 3.8 at 14.3 km at 70°N. Typical values reported during other flight segments were as follows: 5 at 19.8 km at 26°N; 7.0 at 20.9 km at 16°N; 7.2 at 21.8 km at 0°; 4.2 at 20.9 km at 17°S; 3.0 at 19.4 km at 29°S; dropping below 3 all the way to 41°S at New Zealand. Values south of New Zealand were similar, but the error bars were high because of sunlight conditions and thus uncertain normalization.

Integrated Backscattering

The integrated aerosol backscattering function is defined as

$$\int_{h_T}^{28\ \text{km}} f_A(z)\, dz \qquad (2)$$

where f_A is the aerosol backscattering function $(\text{km-sr})^{-1}$ at altitude z, and h_T is the height of the tropopause at the location where the lidar data were taken. The integrated aerosol backscattering function for all usable lidar data from the May 1983 mission was combined and averaged into 2.5° latitude bins, as shown in figure 33. The error bars in figure 33 reflect the uncertainties in the individual lidar profiles and in the corresponding molecular backscattering functions. However, the largest error bars, shown at high latitudes, are due to the high flight altitude experienced on these segments. That is, the lidar profiles do not include the entire stratospheric layer since the layer is lower at high latitudes (as is the tropopause), and the airplane, therefore, was flying in the stratospheric aerosol layer. An estimate was made for integrated aerosol backscatter from the tropopause up to the airplane altitude based on airplane lidar measurements made at lower latitudes and included in the results shown in figure 33.

As can be seen in figure 33, the material appears well spread throughout the latitudes between 72°N and 56°S. The largest peak appears near 50°N, with the most massive portion of the material north of 33°N. Local peaks appear to be near 10°N and possibly 45°S with minima near 30°N and possibly 10°S to 30°S.

Contours of Backscatter Mixing Ratio

The backscatter mixing ratio is defined as f_A/f_M, or $R(z) - 1$. The symbol $R(z)$ was defined previously in equation (1). Contours of backscatter mixing ratio were plotted for all the southbound and northbound lidar data to determine the vertical as well as the latitudinal distribution of the El Chichon-produced aerosol. Figures 34 and 35 contain the northbound and southbound contours, respectively. These figures clearly show that the altitude of the peak mixing ratio decreases with increasing latitude. At latitudes north of 33°N, the bulk of the material is shown to reside below 21 km.

Optical Depth and Mass

By using the size distribution from a six-channel dustsonde launch of May 16, 1983, at Palestine, Texas (32°N), an aerosol optical model was constructed. The model gives a conversion value from integrated backscattering to column density of 21.6 g-sr/m^2 (ref. 9).

Similarly, by using the aerosol characteristics determined from the dustsonde flight as representative of the aerosol over the most massive part of the stratospheric cloud, the value for converting integrated backscattering to optical depth was calculated

to be 43.5 sr. Peak optical depth values of about 0.08 at $\lambda = 0.6943$ μm were thus determined at 50°N.

Concluding Remarks

This report has presented a summary of the lidar data obtained during the May 1983 flight mission, which was conducted to determine the spatial distribution and aerosol characteristics of the El Chichon-produced stratospheric material. Vertical profiles of aerosol backscatter ratio were determined which showed that material produced by the El Chichon eruptions of late March–early April 1982 had spread throughout the latitudes of the flight (72°N to 56°S). The most massive portion of the material measured by this flight resided north of 33°N and was concentrated below 21 km. In this latitude region (33°N to 72°N), peak backscatter ratios at a wavelength of 0.6943 μm varied between 3.5 and 4.5, and peak integrated backscattering was about $18 \times 10^{-4} \mathrm{sr}^{-1}$, corresponding to a calculated peak optical depth of approximately 0.08. Plots of integrated backscattering values versus latitude and of contours of backscatter mixing ratio versus altitude and latitude further describe the latitudinal and vertical distribution of the El Chichon aerosol. In addition, tables containing numerical values of the backscatter ratio and backscattering function versus altitude have been supplied for each profile. Thus, the lidar data from this mission have been presented in a ready-to-use format for further scientific analysis.

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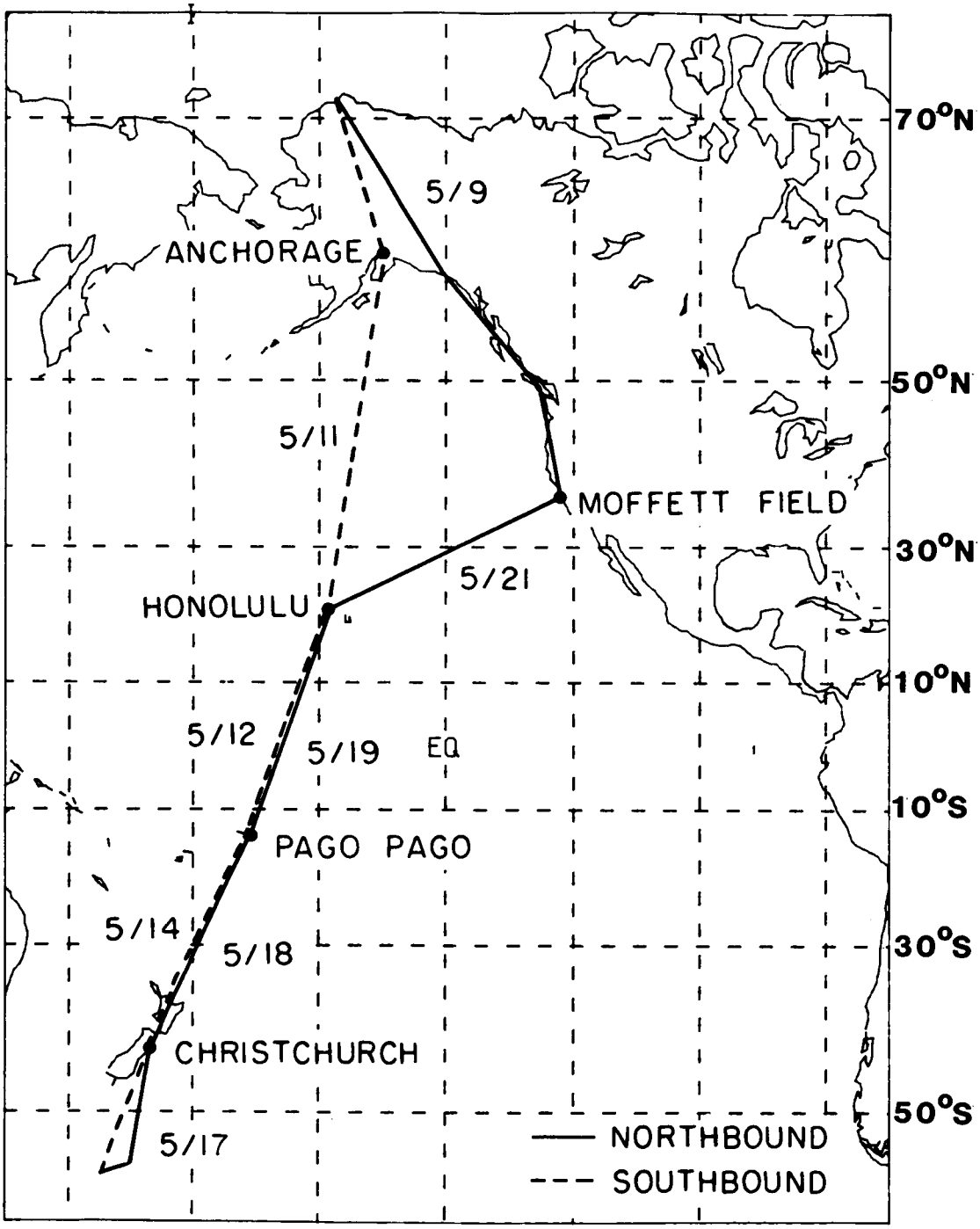

Figure 1. Flight path of NASA Convair 990 airplane from May 9–21, 1983.

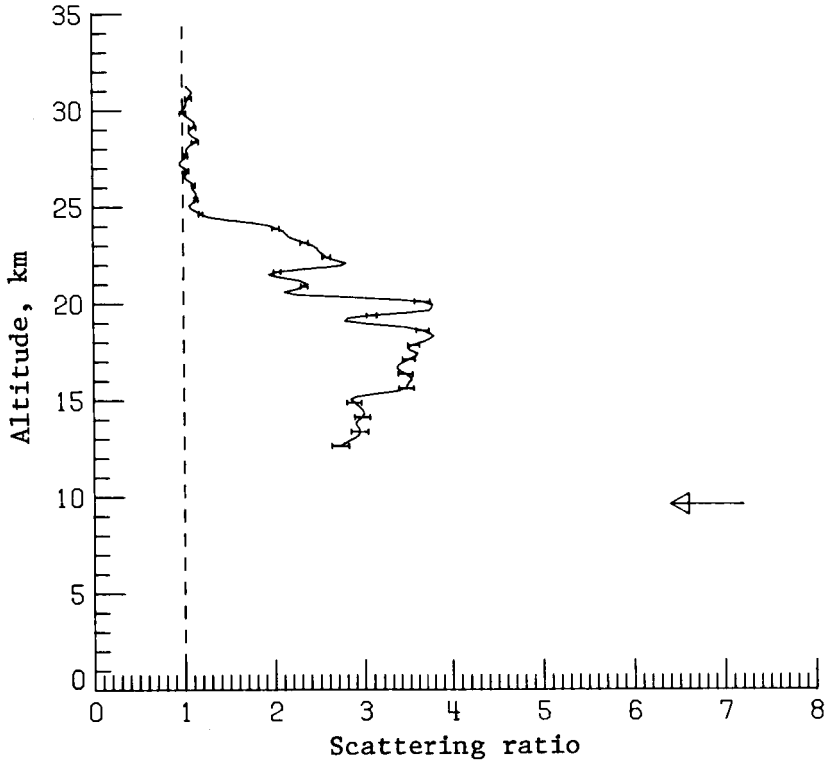

Figure 2. Lidar scattering-ratio profile taken on May 9, 1983, at GMT 0706–0720 between 38.9°N, 122.2°W and 40.6°N, 122.3°W.

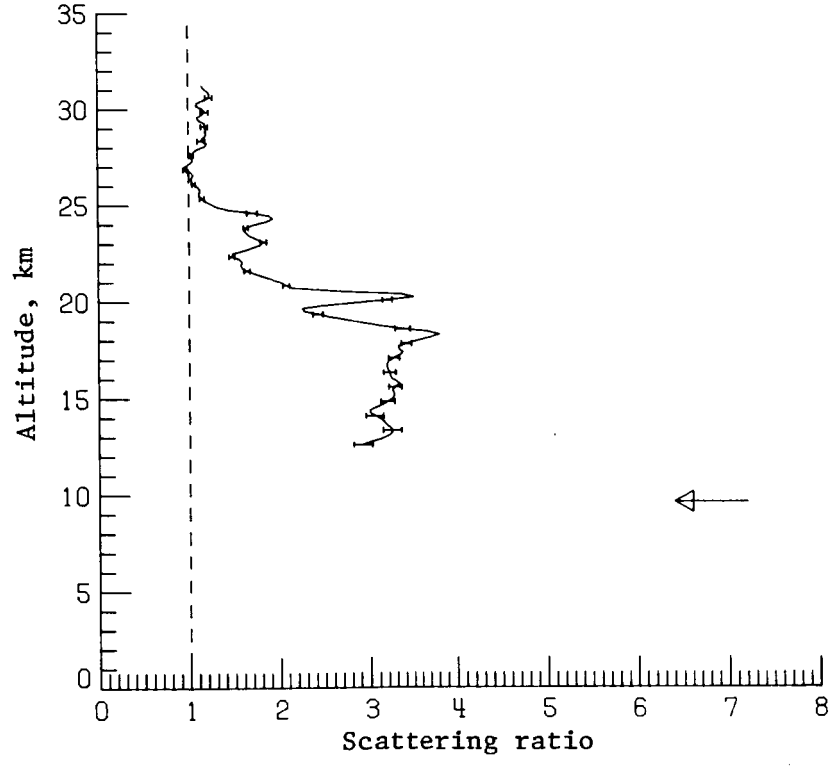

Figure 3. Lidar scattering-ratio profile taken on May 9, 1983, at GMT 0733–0746 between 42.1°N, 122.3°W and 43.5°N, 122.3°W.

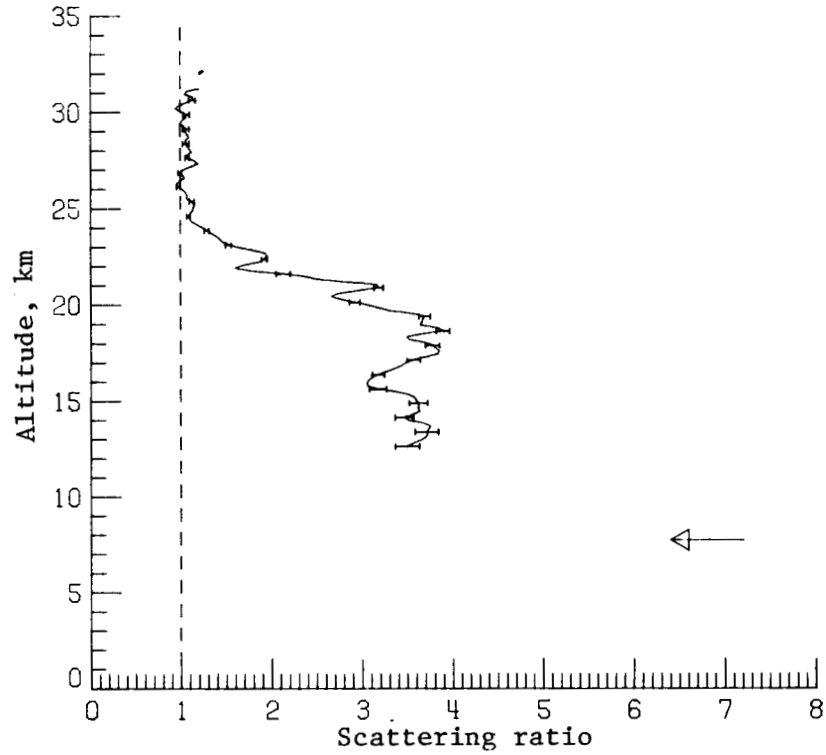

Figure 4. Lidar scattering-ratio profile taken on May 9, 1983, at GMT 1028–1041 between 48.2°N, 124.4°W and 49.3°N, 126.1°W.

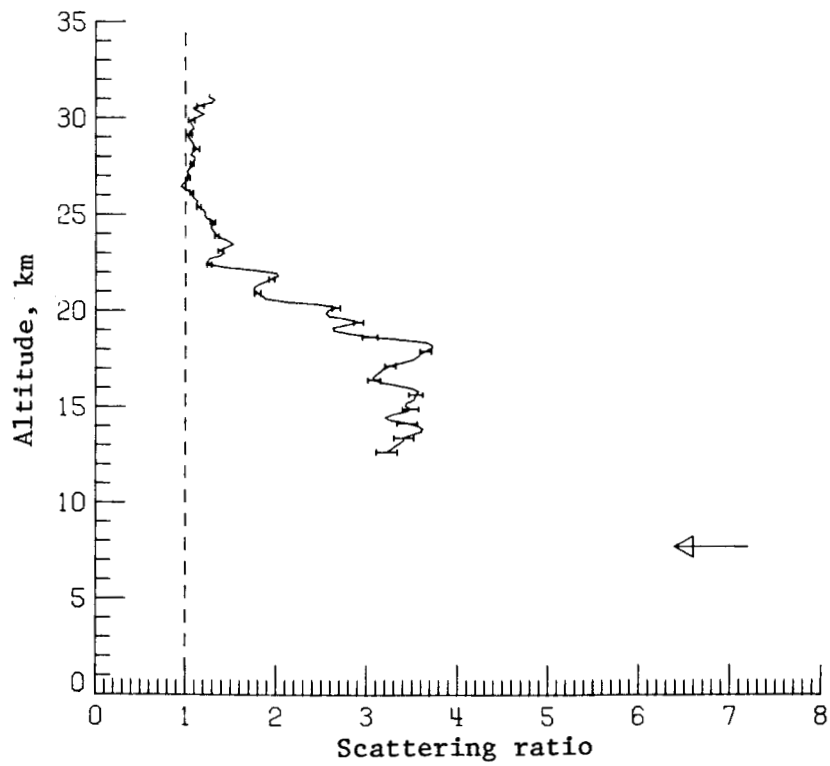

Figure 5. Lidar scattering-ratio profile taken on May 9, 1983, at GMT 1055–1108 between 50.5°N, 128.0°W and 51.8°N, 129.7°W.

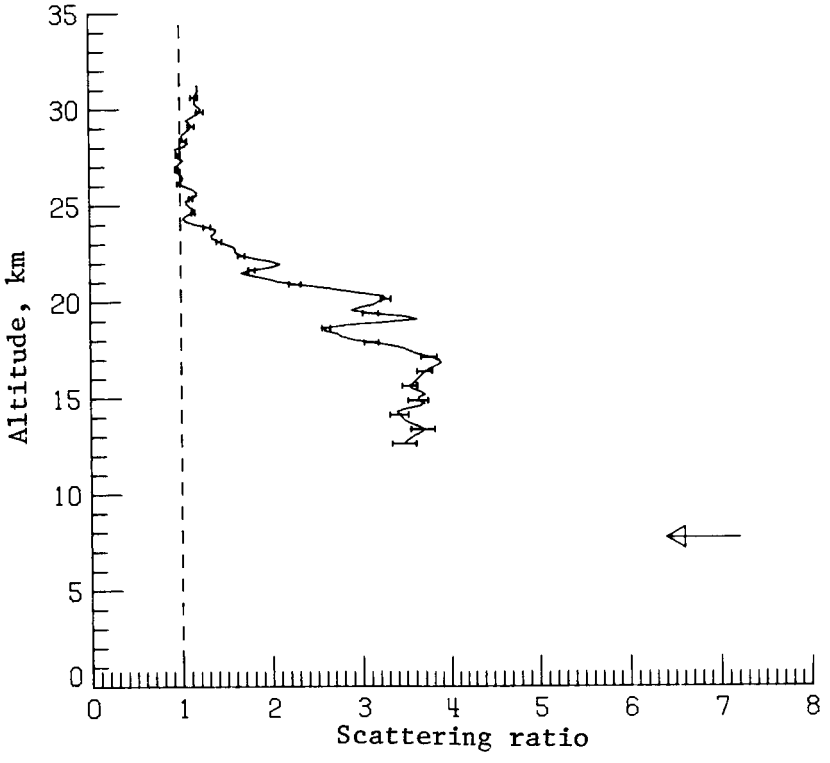

Figure 6. Lidar scattering-ratio profile taken on May 9, 1983, at GMT 1145–1154 between 55.5°N, 134.0°W and 56.5°N, 135.1°W.

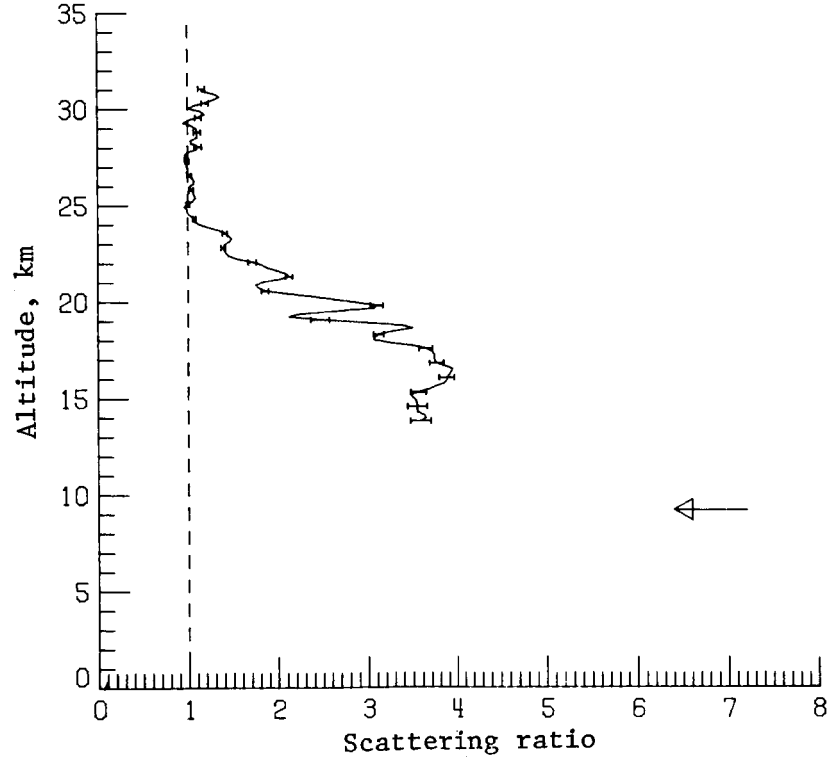

Figure 7. Lidar scattering-ratio profile taken on May 9, 1983, at GMT 1218–1229 between 58.7°N, 138.2°W and 59.7°N, 139.8°W.

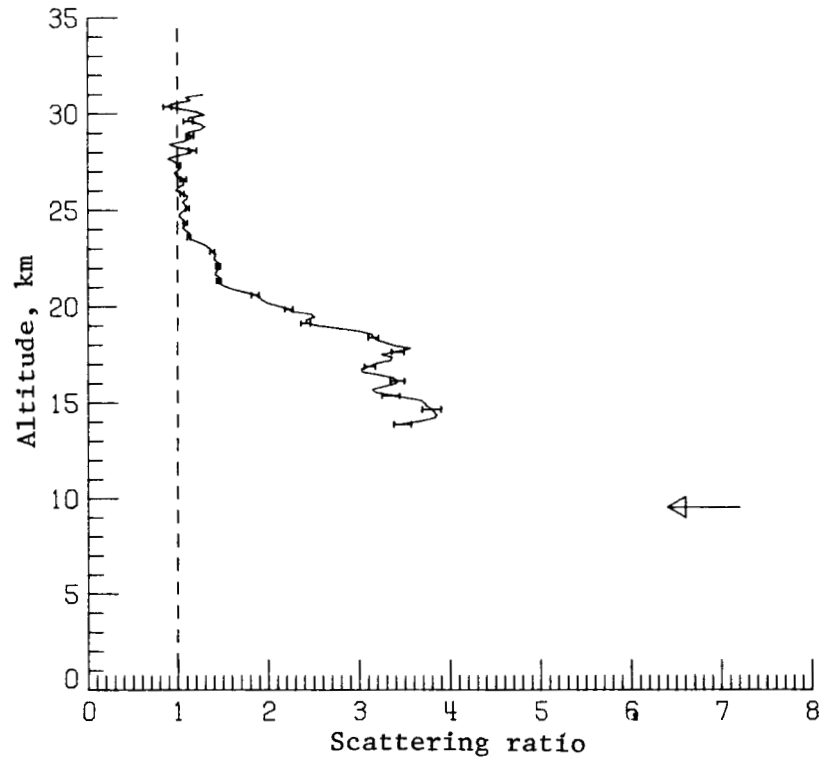

Figure 8. Lidar scattering-ratio profile taken on May 9, 1983, at GMT 1357–1417 between 69.2°N, 150.9°W and 71.0°N, 155.9°W.

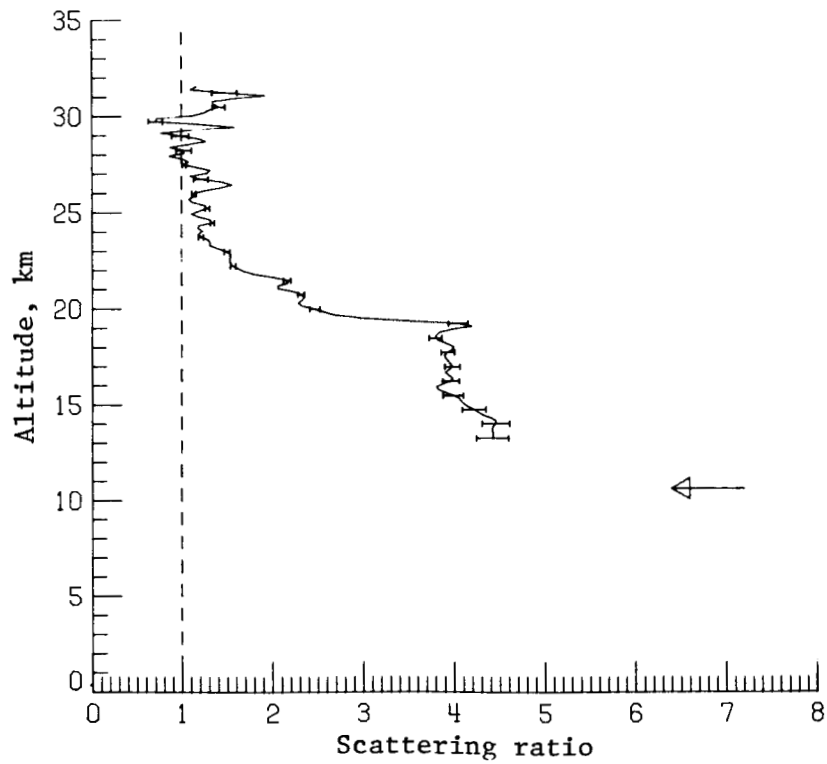

Figure 9. Lidar scattering-ratio profile taken on May 11, 1983, at GMT 1556–1623 between 55.4°N, 156.7°W and 51.9°N, 155.5°W.

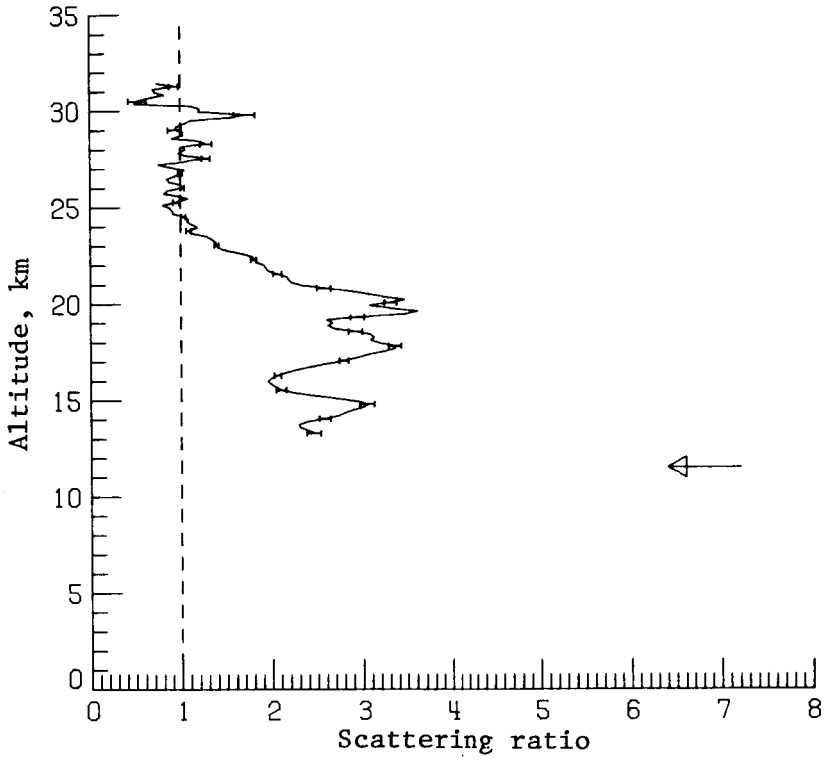

Figure 10. Lidar scattering-ratio profile taken on May 11, 1983, at GMT 1714–1743 between 44.5°N, 152.5°W and 40.4°N, 151.8°W.

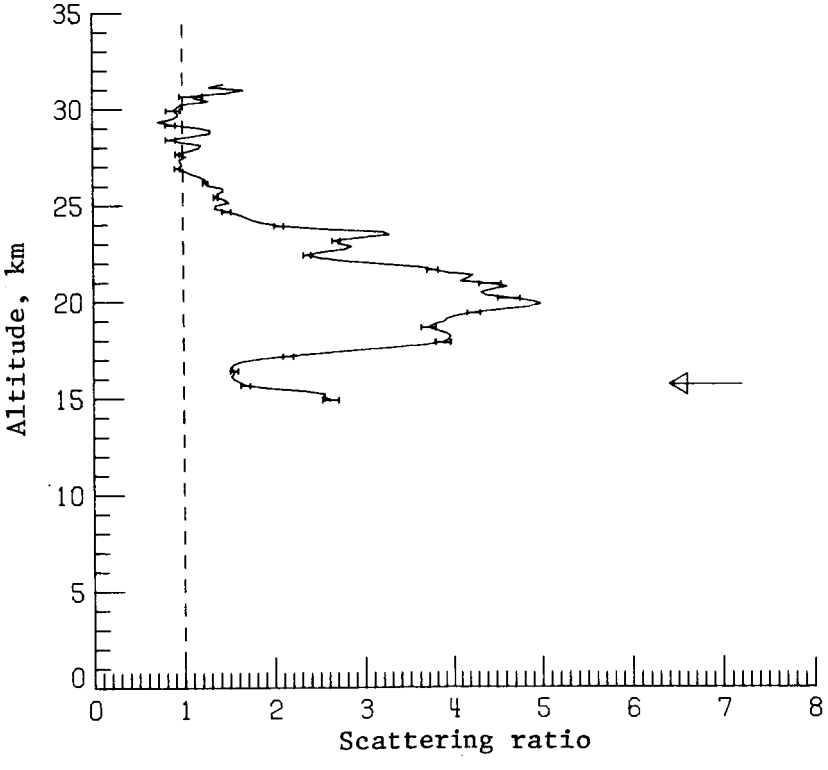

Figure 11. Lidar scattering-ratio profile taken on May 11, 1983, at GMT 1927–1947 between 27.6°N, 154.3°W and 25.6°N, 156.0°W.

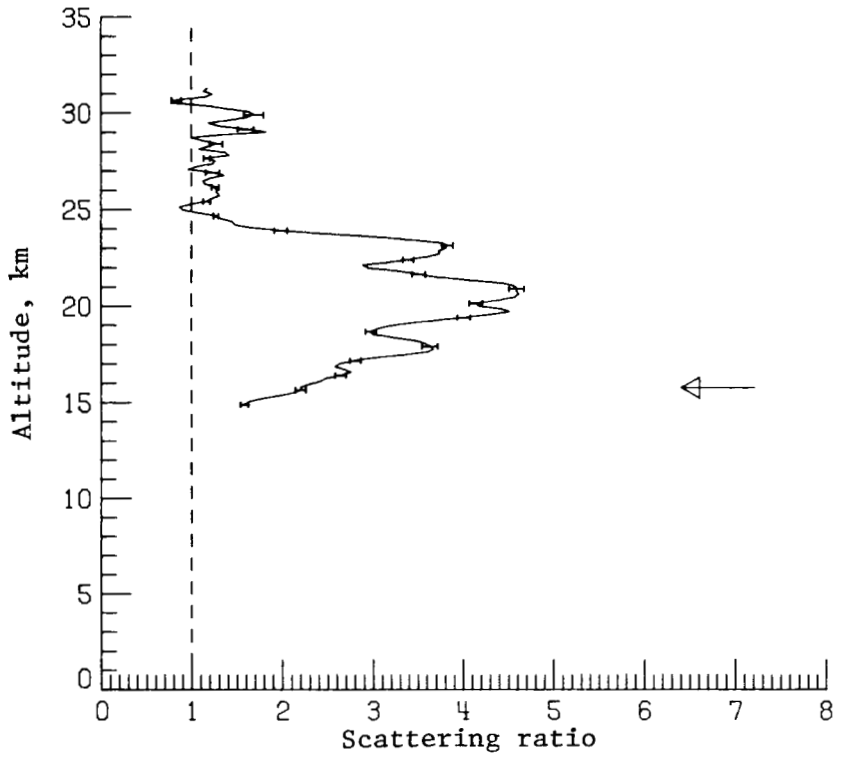

Figure 12. Lidar scattering-ratio profile taken on May 11, 1983, at GMT 1947–2010 between 25.6°N, 156.0°W and 22.9°N, 156.8°W.

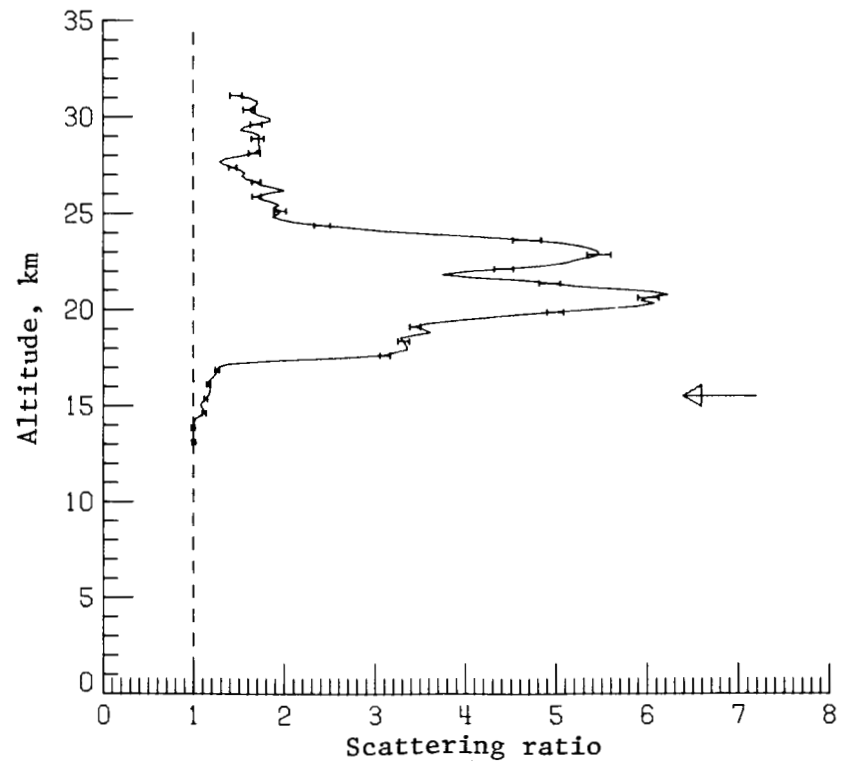

Figure 13. Lidar scattering-ratio profile taken on May 12, 1983, at GMT 1509–1522 between 19.0°N, 159.9°W and 17.6°N, 160.8°W.

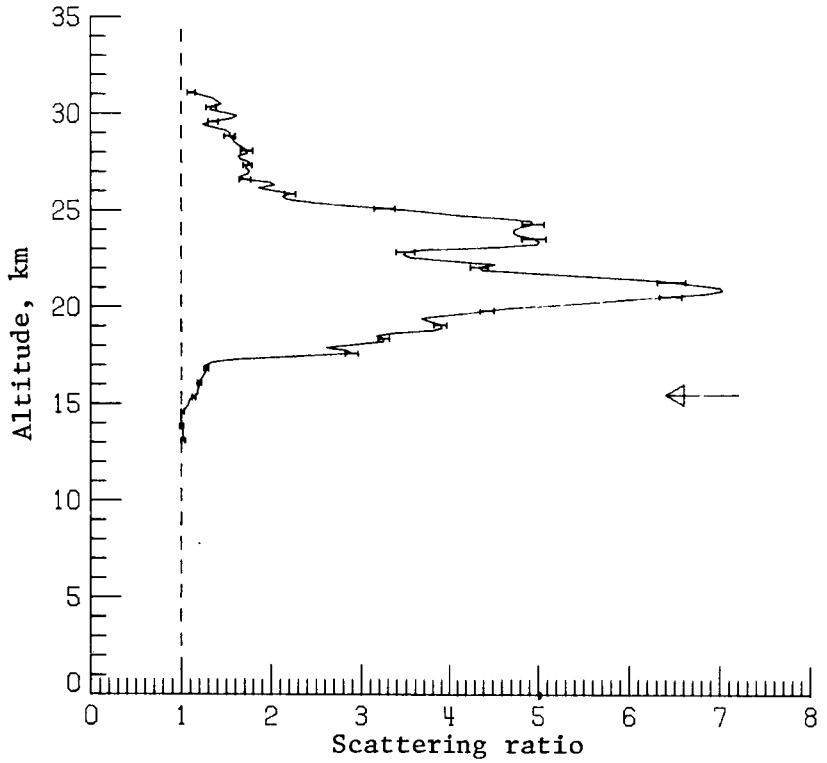

Figure 14. Lidar scattering-ratio profile taken on May 12, 1983, at GMT 1536–1547 between 16.2°N, 161.9°W and 15.0°N, 162.6°W.

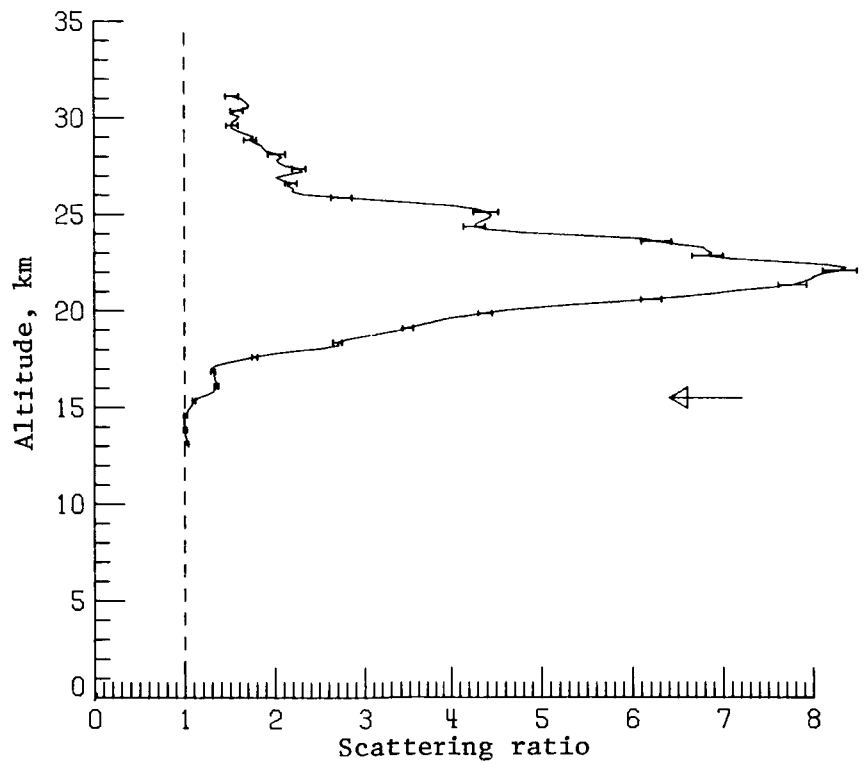

Figure 15. Lidar scattering-ratio profile taken on May 12, 1983, at GMT 1610–1623 between 12.5°N, 164.2°W and 11.1°N, 165.1°W.

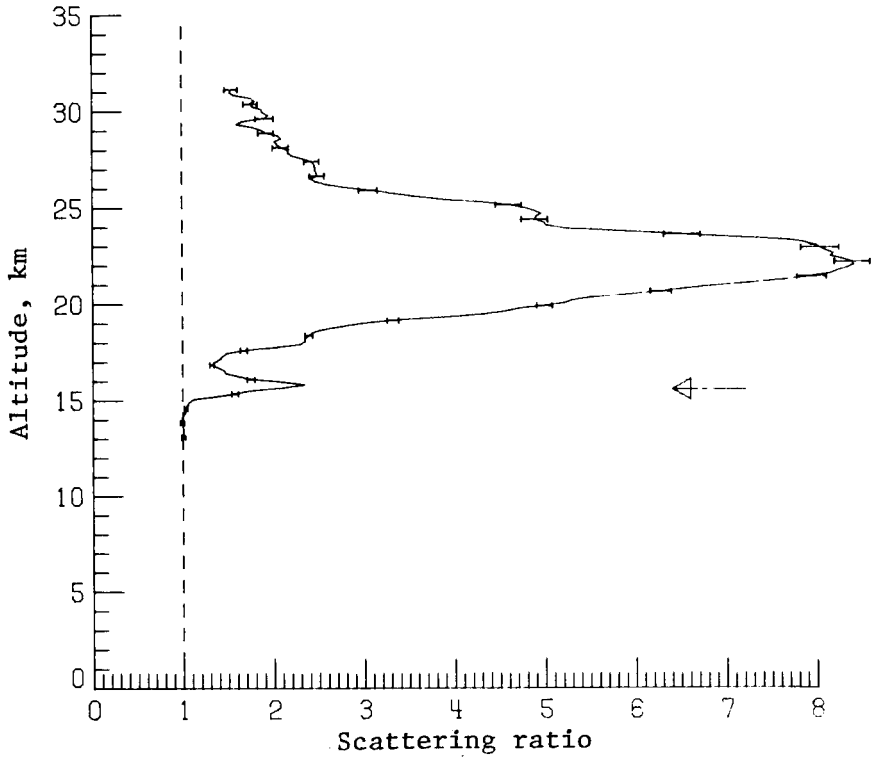

Figure 16. Lidar scattering-ratio profile taken on May 12, 1983, at GMT 1637–1650 between 9.5°N, 166.1°W and 8.0°N, 167.0°W.

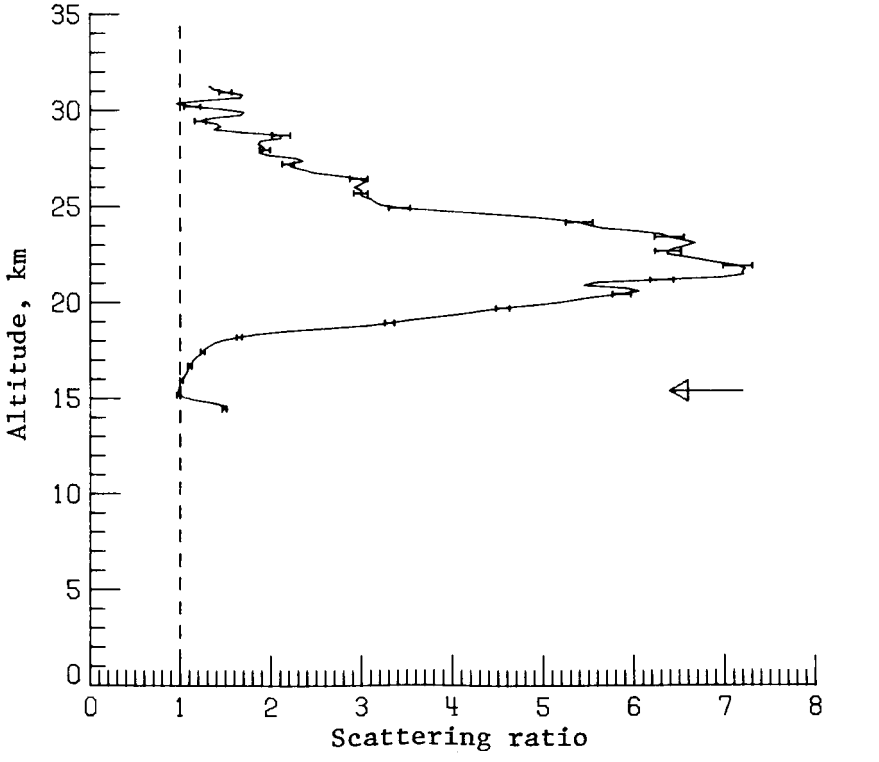

Figure 17. Lidar scattering-ratio profile taken on May 12, 1983, at GMT 1752–1812 between 1.1°N, 171.0°W and 1.3°S, 170.2°W.

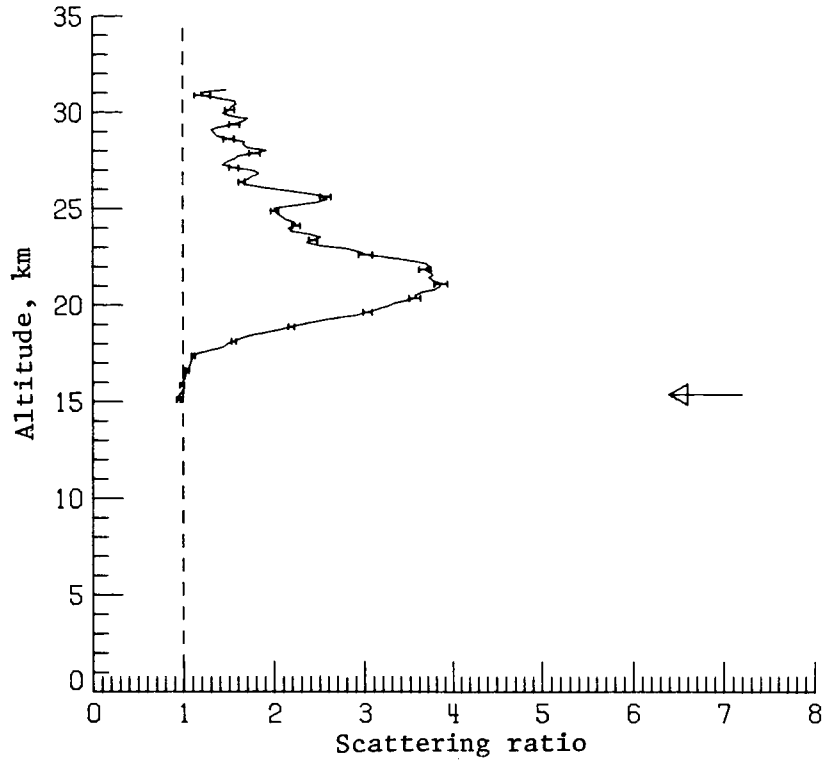

Figure 18. Lidar scattering-ratio profile taken on May 12, 1983, at GMT 1934–1946 between 11.1°S, 168.9°W and 12.4°S, 169.7°W.

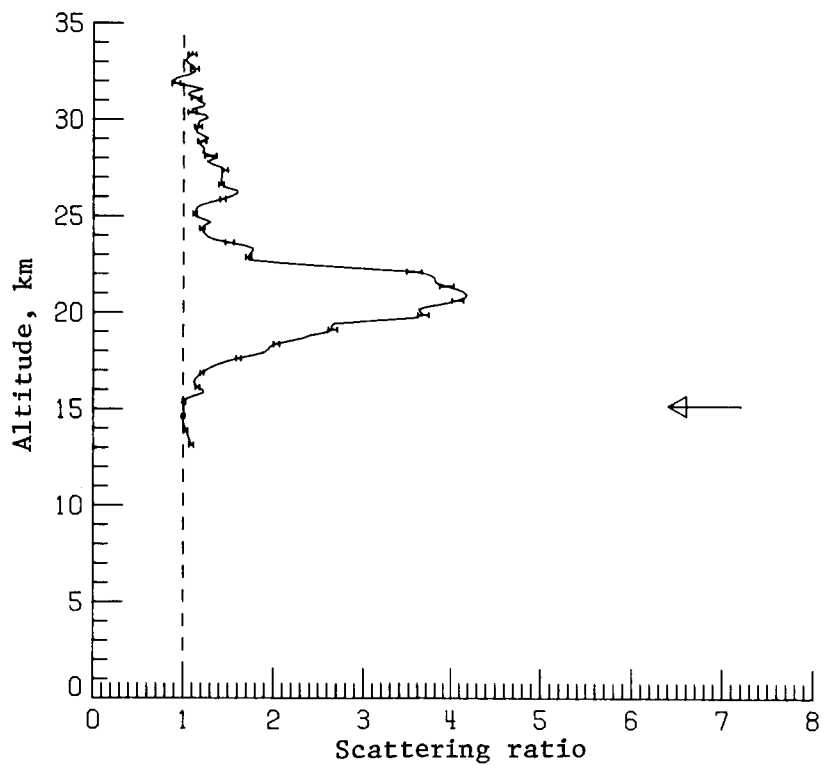

Figure 19. Lidar scattering-ratio profile taken on May 14, 1983, at GMT 0549–0556 between 16.9°S, 171.1°W and 17.7°S, 172.0°W.

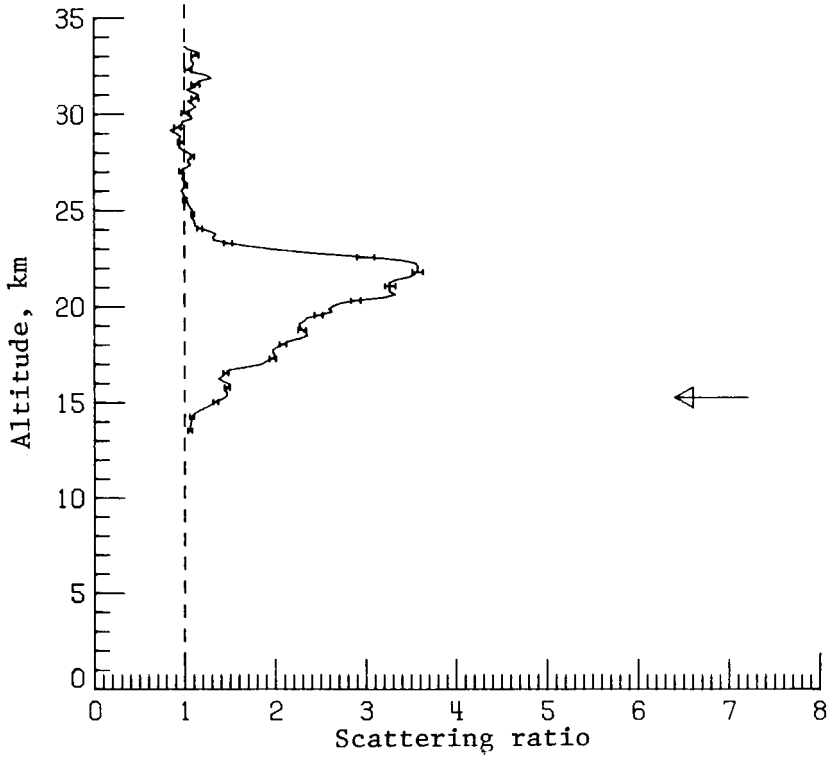

Figure 20. Lidar scattering-ratio profile taken on May 14, 1983, at GMT 0641–0649 between 23.0°S, 174.2°W and 23.8°S, 174.5°W.

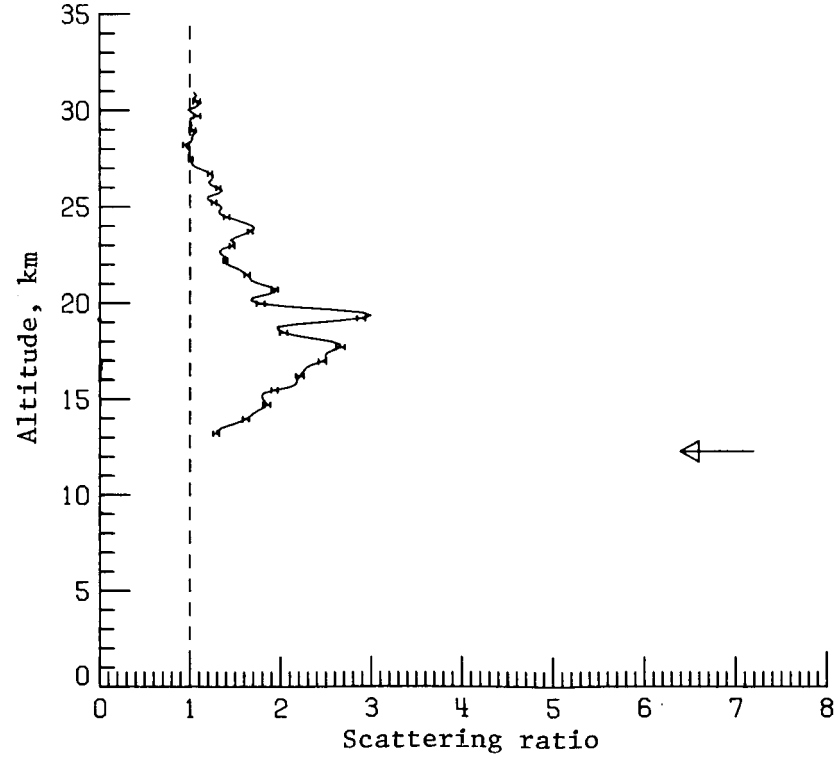

Figure 21. Lidar scattering-ratio profile taken on May 14, 1983, at GMT 0736–0750 between 28.6°S, 176.7°W and 30.0°S, 177.3°W.

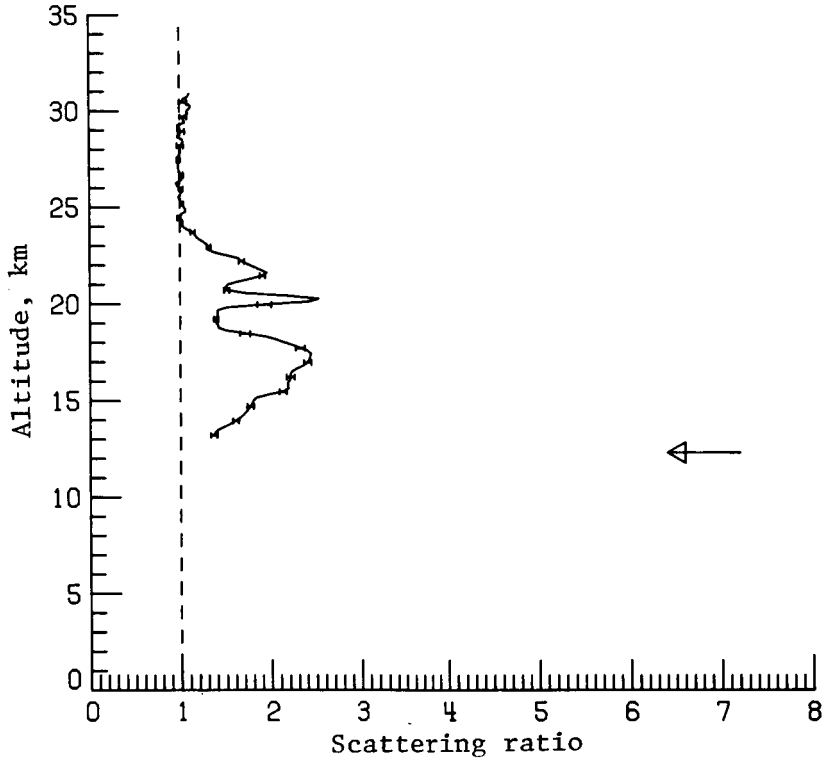

Figure 22. Lidar scattering-ratio profile taken on May 14, 1983, at GMT 0831–0844 between 34.0°S, 179.4°W and 35.3°S, 179.9°E.

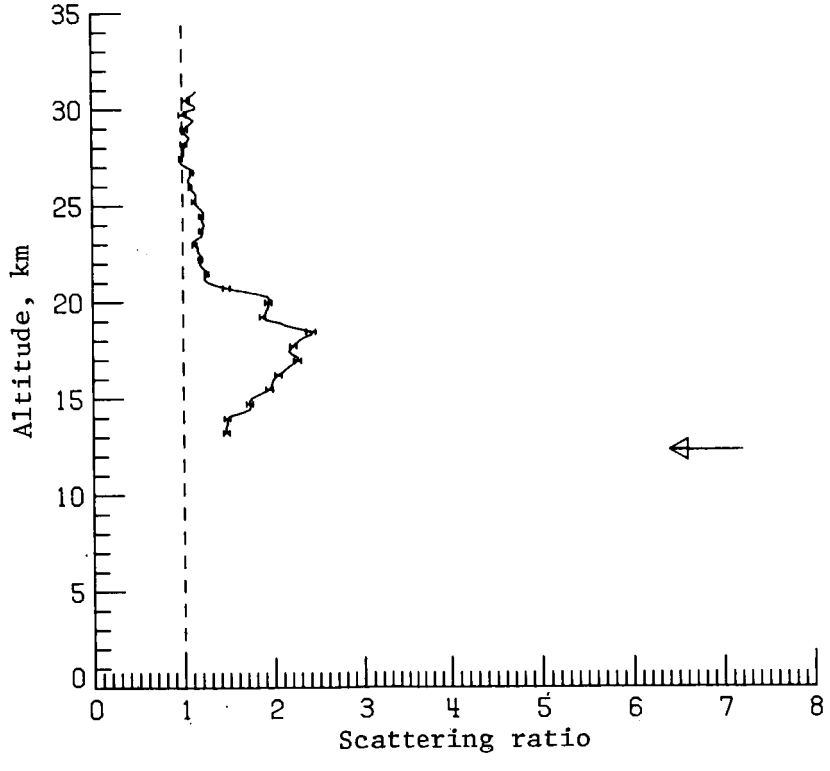

Figure 23. Lidar scattering-ratio profile taken on May 14, 1983, at GMT 0920–0933 between 38.8°S, 177.8°E and 39.8°S, 176.5°E.

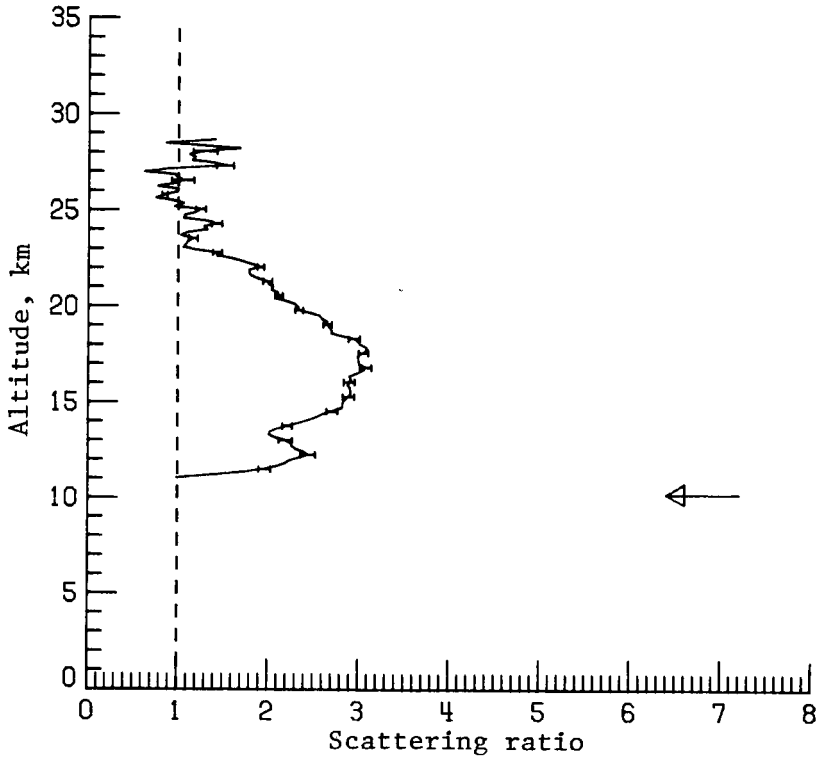

Figure 24. Lidar scattering-ratio profile taken on May 17, 1983, at GMT 0056–0116 between 45.6°S, 170.6°E and 47.9°S, 168.0°E.

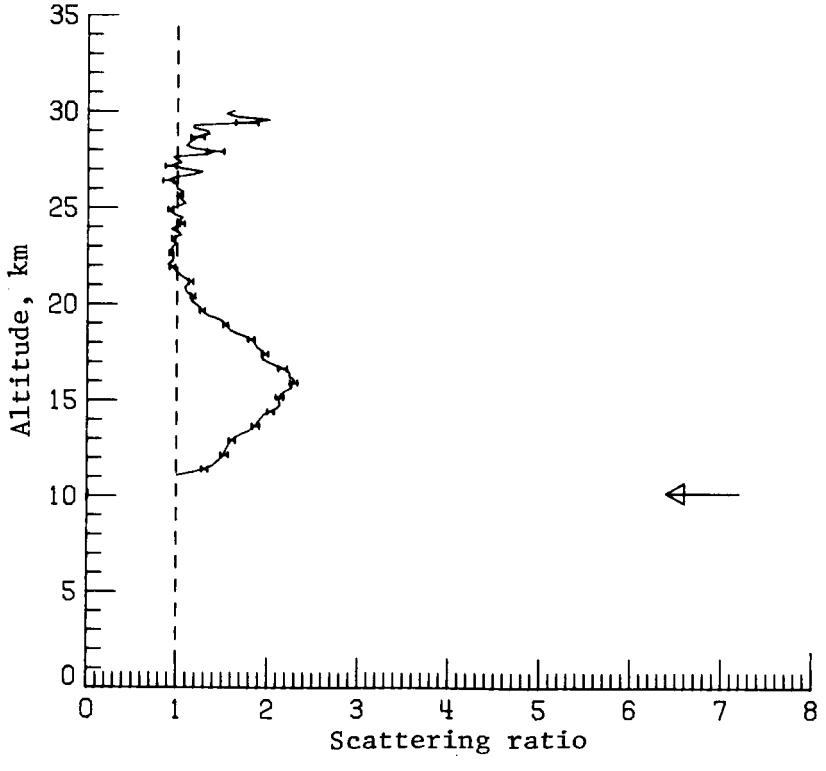

Figure 25. Lidar scattering-ratio profile taken on May 17, 1983, at GMT 0224–0244 between 53.4°S, 168.2°E and 55.8°S, 167.1°E.

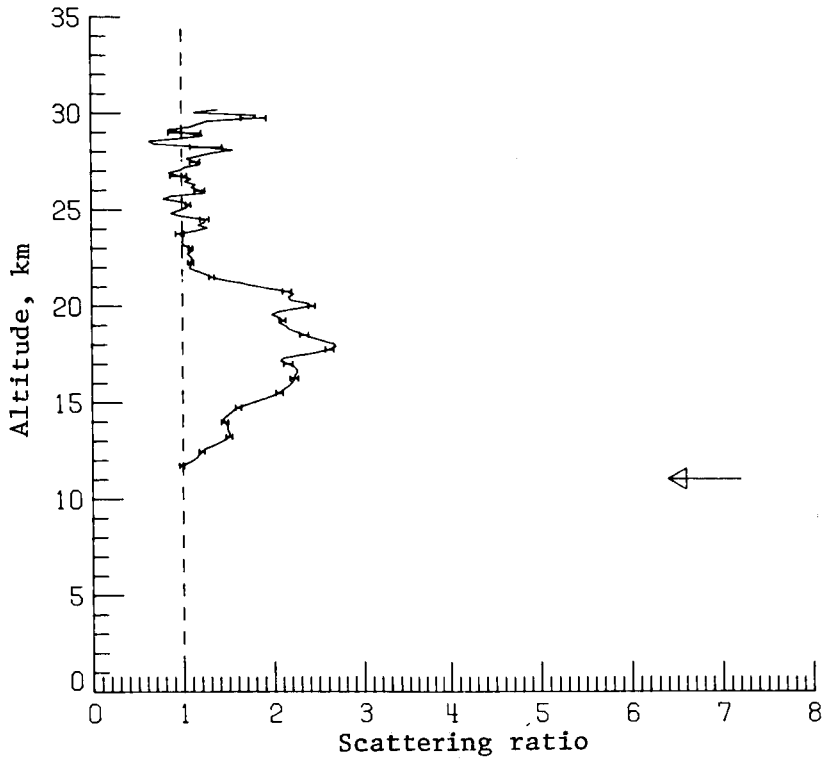

Figure 26. Lidar scattering-ratio profile taken on May 18, 1983, at GMT 0021–0043 between 37.3°S, 174.5°E and 34.9°S, 175.2°E.

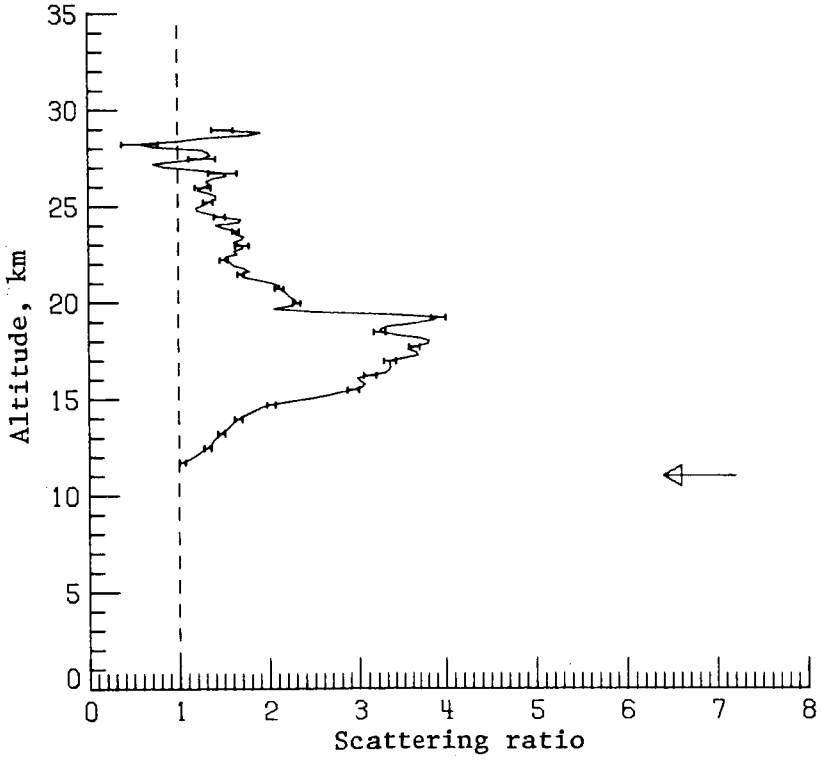

Figure 27. Lidar scattering-ratio profile taken on May 18, 1983, at GMT 0112–0136 between 31.5°S, 175.9°E and 28.5°S, 176.3°E.

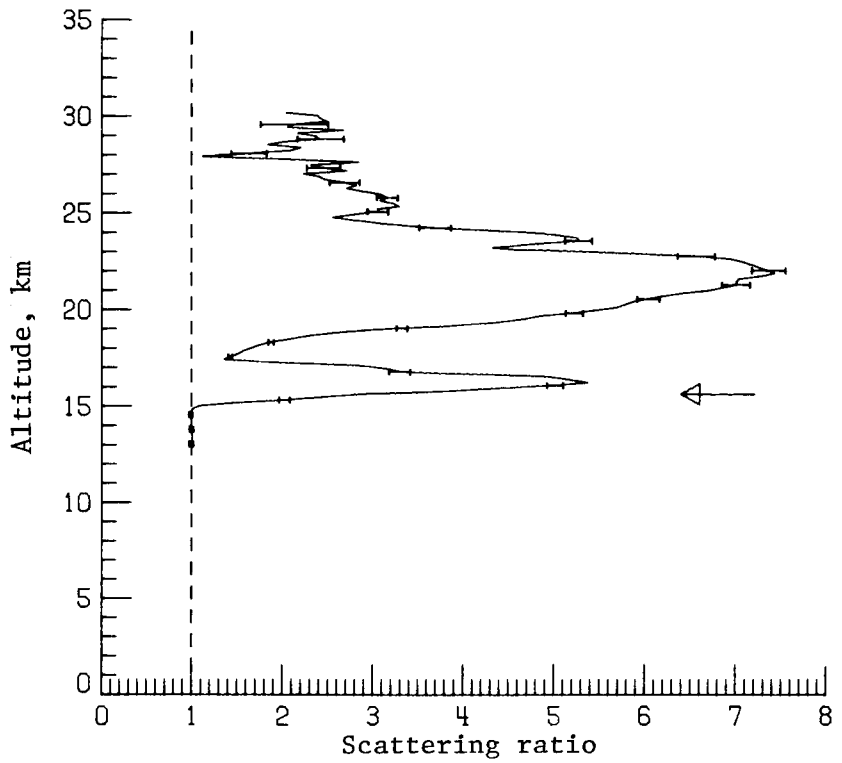

Figure 28. Lidar scattering-ratio profile taken on May 19, 1983, at GMT 0102–0125 between 5.8°S, 167.5°W and 2.9°S, 166.5°W.

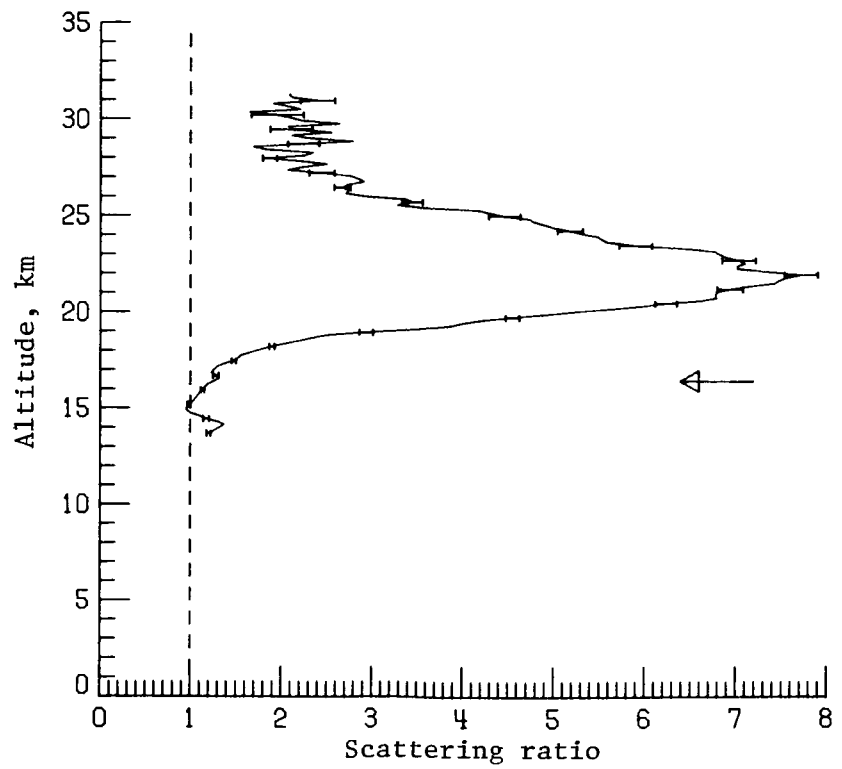

Figure 29. Lidar scattering-ratio profile taken on May 19, 1983, at GMT 0225–0246 between 4.3°N, 163.0°W and 6.8°N, 161.7°W.

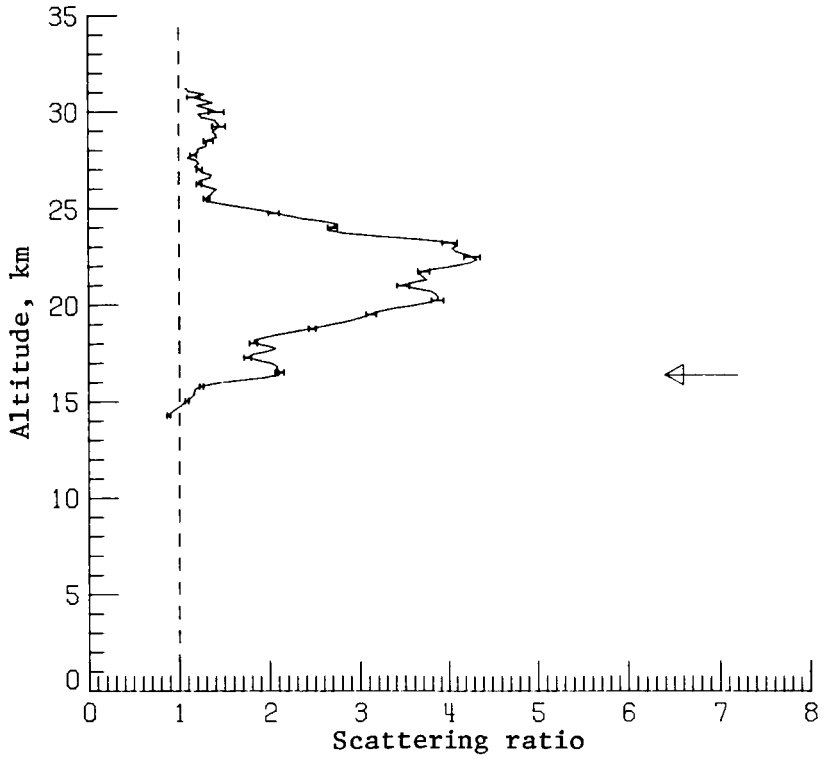

Figure 30. Lidar scattering-ratio profile taken on May 19, 1983, at GMT 0349–0416 between 14.5°N, 158.3°W and 17.8°N, 156.9°W.

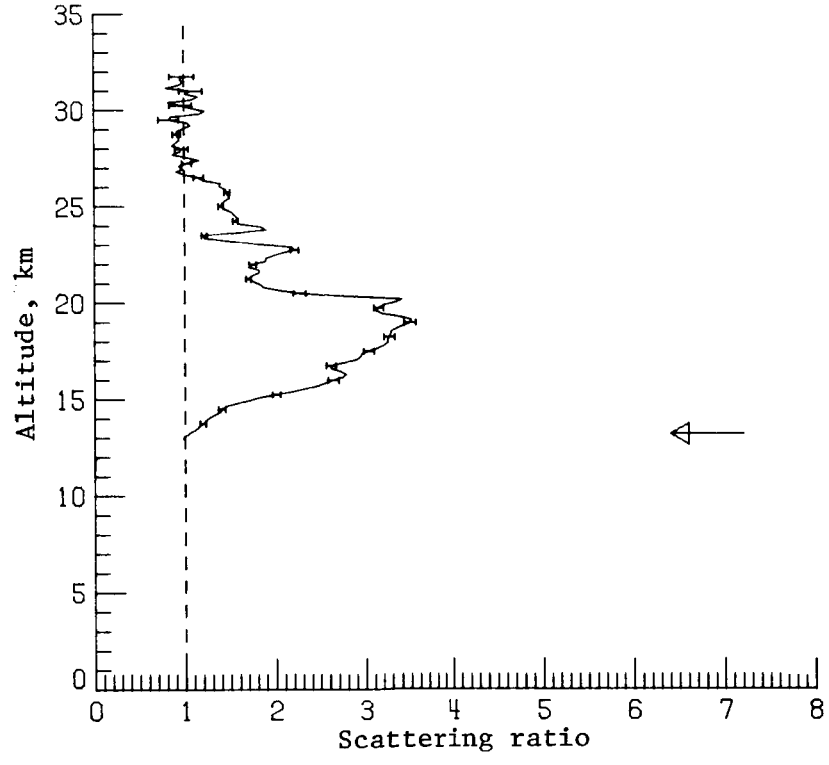

Figure 31. Lidar scattering-ratio profile taken on May 21, 1983, at GMT 0109–0132 between 30.9°N, 129.3°W and 31.8°N, 125.9°W.

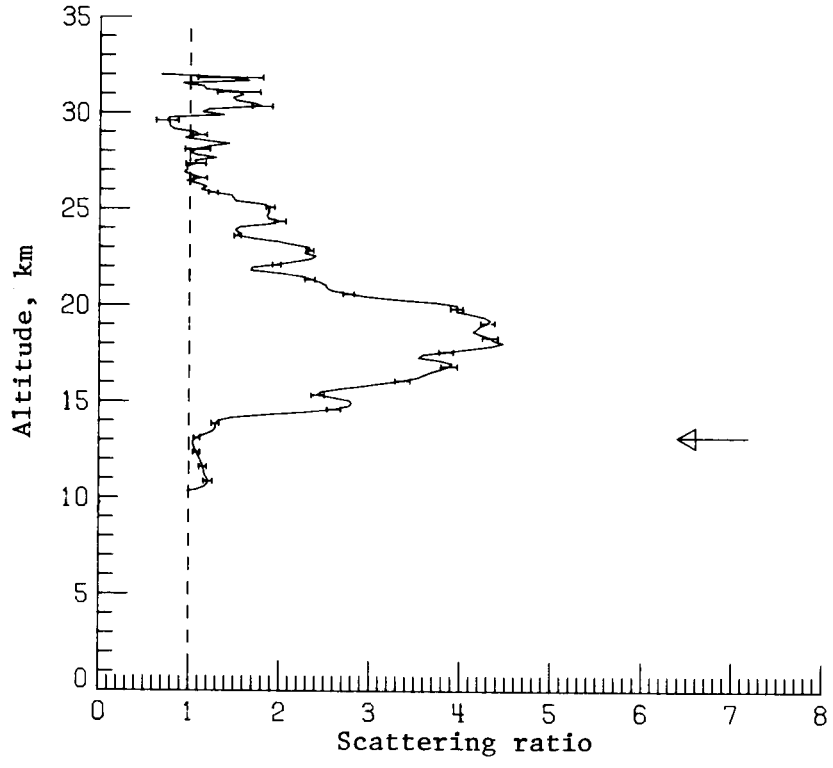

Figure 32. Lidar scattering-ratio profile taken on May 21, 1983, at GMT 0209–0227 between 34.7°N, 122.3°W and 36.8°N, 121.4°W.

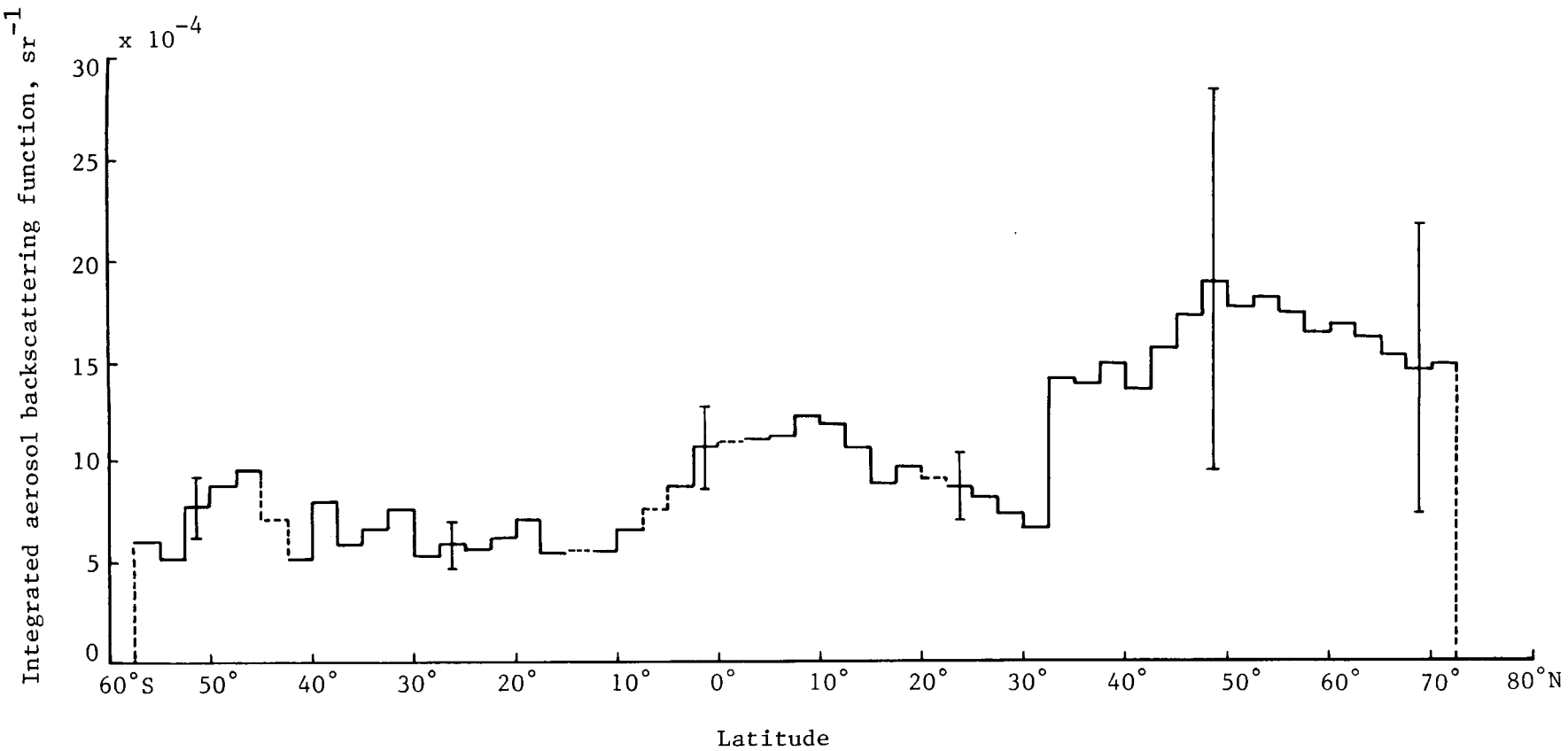

Figure 33. Integrated aerosol backscattering function from tropopause through stratospheric layer averaged into 2.5° latitude bins.

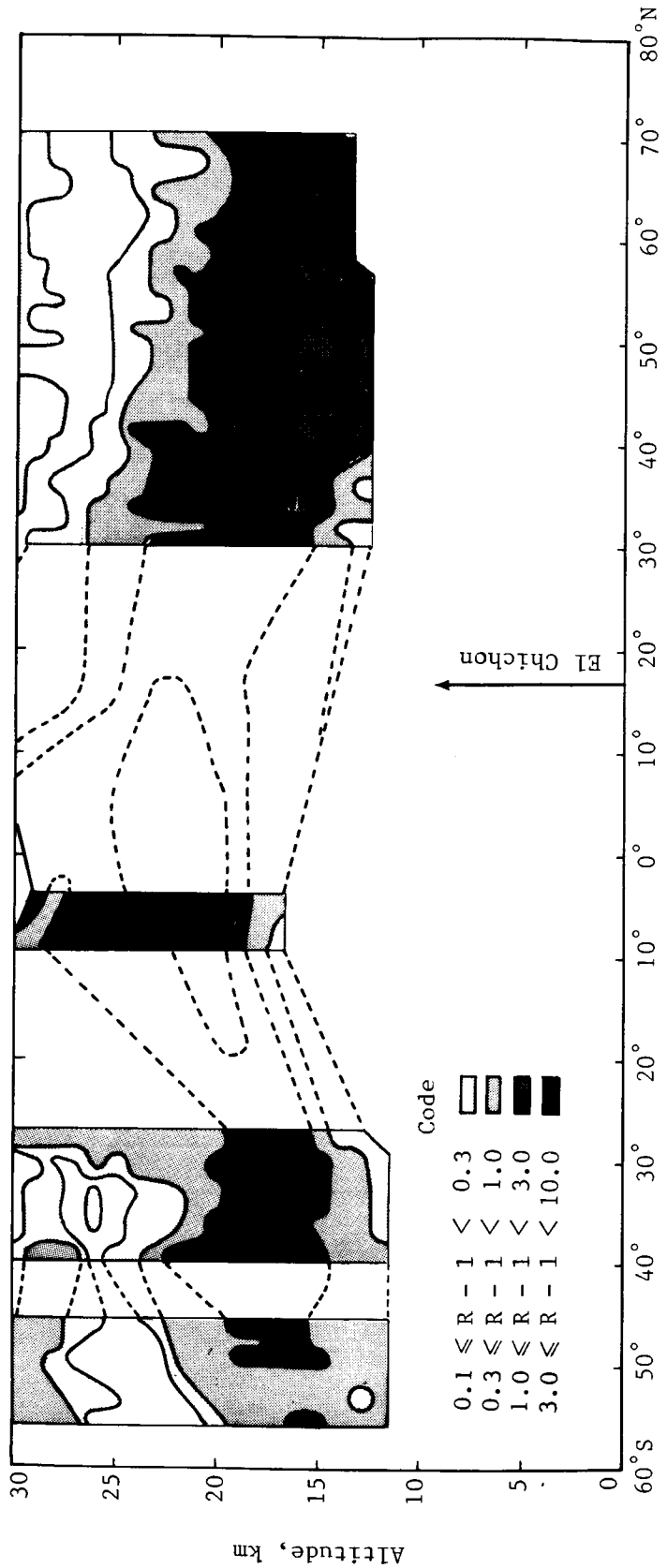

Figure 34. Contour of backscatter mixing ratio for data collected during northbound flight legs.

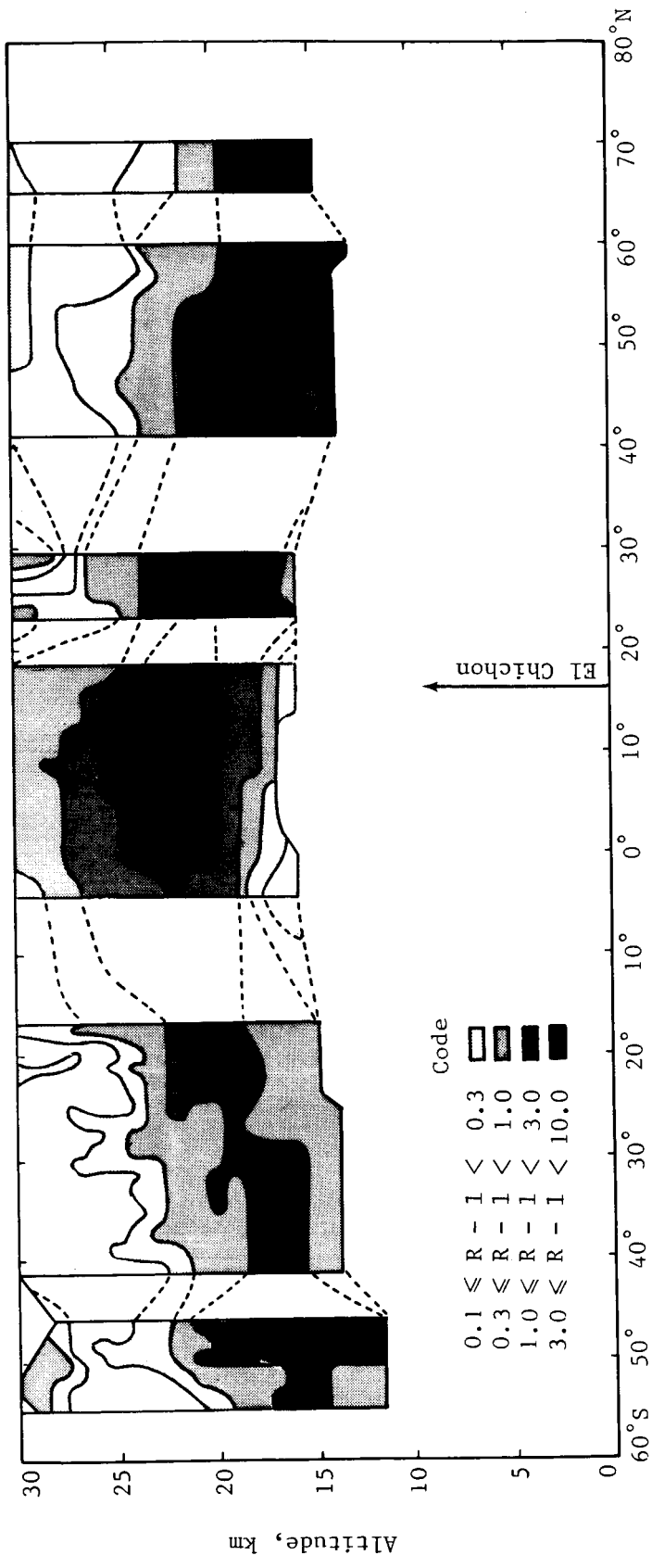

Figure 35. Contour of backscatter mixing ratio for data collected during southbound flight legs.

Appendix

Flight Log and Numerical Values of Scattering Ratios and Scattering Functions for Flight Mission

Table A1. Flight Log During Lidar Operation

Date	GMT[a]	Location	Altitude, ft
May 9	0706–0800	38.9°N, 122.2°W–45.1°N, 122.4°W	31 000
	1028–1154	48.2°N, 124.4°W–56.5°N, 135.1°W	31 000
	1158–1417	56.9°N, 135.5°W–71.0°N, 155.9°W	35 000
	1436–1530	70.4°N, 159.8°W–64.2°N, 152.1°W	37 000
May 11	1505–1522	60.3°N, 154.0°W–59.2°N, 158.0°W	31 000
	1530–1743	58.3°N, 158.1°W–40.4°N, 151.8°W	33 000
	1901–2010	30.0°N, 152.0°W–22.9°N, 156.8°W	37 000
May 12	1509–1650	19.0°N, 159.9°W–8.0°N, 167.0°W	31 000
	1655–1735	7.5°N, 167.3°W–3.0°N, 170.0°W	33 000
	1752–1839	1.1°N, 171.0°W–4.6°S, 169.1°W	35 000
	1934–1946	11.1°S, 168.9°W–12.4°S, 169.7°W	37 000
May 14	0549–0638	16.9°S, 171.7°W–22.6°S, 174.0°W	31 000
	0641–0947	23.0°S, 174.2°W 41.1°S, 175.1°E	33 000
May 17	0056–0305	45.6°S, 170.6°E–55.0°S, 170.8°E	33 000
	0318–0331	54.0°S, 172.6°E–52.6°S, 172.6°E	24 000
	0357–0437	49.8°S, 172.5°E–45.6°S, 172.5°E	33 000
May 17–18	2354–0043	40.6°S, 173.4°E–34.9°S, 175.2°E	33 000
	0046–0156	34.5°S, 175.2°E–26.0°S, 176.5°E	35 000
	0304–0328	19.5°S, 175.8°E–16.8°S, 173.5°W	37 000
May 19	0024–0125	10.6°S, 169.3°W–2.9°S, 166.5°W	33 000
	0225–0246	4.3°N, 163.0°W–6.8°N, 161.7°W	35 000
	0349–0416	14.5°N, 158.3°W–17.8°N, 156.9°W	37 000
May 21	0045–0106	29.9°N, 133.0°W–30.8°N, 129.8°W	34 000
	0109–0132	30.9°N, 129.3°W–31.8°N, 125.9°W	36 000
	0154–0227	32.8°N, 123.0°W–36.8°N, 121.4°W	29 000

[a]Greenwich mean time.

Table A2. Lidar Data Taken on May 9, 1983, at GMT 0706–0720 Between 38.9°N, 122.2°W and 40.6°N, 122.3°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
12.612	2.730	.2055E-03	18.462	3.745	.1310E-03
12.762	2.783	.2070E-03	18.612	3.659	.1241E-03
12.912	2.840	.2086E-03	18.762	3.465	.1125E-03
13.062	2.905	.2110E-03	18.912	3.067	.9220E-04
13.212	2.941	.2099E-03	19.062	2.783	.7775E-04
13.362	2.948	.2058E-03	19.212	2.823	.7769E-04
13.512	2.941	.2003E-03	19.362	3.089	.8703E-04
13.662	2.915	.1932E-03	19.512	3.471	.1007E-03
13.812	2.902	.1877E-03	19.662	3.745	.1093E-03
13.962	2.933	.1865E-03	19.812	3.778	.1081E-03
14.112	2.978	.1866E-03	19.962	3.782	.1059E-03
14.262	2.997	.1842E-03	20.112	3.659	.9893E-04
14.412	2.993	.1797E-03	20.262	2.995	.7255E-04
14.562	2.965	.1733E-03	20.412	2.260	.4481E-04
14.712	2.923	.1658E-03	20.562	2.111	.3860E-04
14.862	2.887	.1591E-03	20.712	2.261	.4283E-04
15.012	2.845	.1521E-03	20.862	2.338	.4439E-04
15.162	2.911	.1540E-03	21.012	2.355	.4392E-04
15.312	3.132	.1680E-03	21.162	2.272	.4027E-04
15.462	3.357	.1816E-03	21.312	2.081	.3344E-04
15.612	3.468	.1859E-03	21.462	1.941	.2845E-04
15.762	3.478	.1825E-03	21.612	2.038	.3065E-04
15.912	3.495	.1797E-03	21.762	2.384	.3993E-04
16.062	3.533	.1784E-03	21.912	2.734	.4887E-04
16.212	3.507	.1724E-03	22.062	2.799	.4954E-04
16.362	3.456	.1648E-03	22.212	2.669	.4490E-04
16.512	3.394	.1568E-03	22.362	2.580	.4153E-04
16.662	3.356	.1506E-03	22.512	2.540	.3955E-04
16.812	3.377	.1483E-03	22.662	2.497	.3756E-04
16.962	3.434	.1482E-03	22.812	2.481	.3630E-04
17.112	3.495	.1483E-03	22.962	2.435	.3438E-04
17.262	3.572	.1492E-03	23.112	2.341	.3137E-04
17.412	3.599	.1471E-03	23.262	2.248	.2852E-04
17.562	3.519	.1391E-03	23.412	2.167	.2607E-04
17.712	3.478	.1336E-03	23.562	2.137	.2480E-04
17.862	3.552	.1343E-03	23.712	2.105	.2355E-04
18.012	3.655	.1363E-03	23.862	2.025	.2134E-04
18.162	3.733	.1369E-03	24.012	1.941	.1915E-04
18.312	3.796	.1367E-03	24.162	1.750	.1489E-04

Table A2. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.312	1.465	.9010E-05	30.162	1.029	.2243E-06
24.462	1.271	.5133E-05	30.312	1.037	.2799E-06
24.612	1.195	.3600E-05	30.462	1.041	.3015E-06
24.762	1.137	.2476E-05	30.612	1.067	.4804E-06
24.912	1.081	.1436E-05	30.762	1.079	.5511E-06
25.062	1.066	.1131E-05	30.912	1.103	.7065E-06
25.212	1.109	.1835E-05	31.062	1.078	.5243E-06
25.362	1.144	.2360E-05	31.212	1.043	.2824E-06
25.512	1.141	.2257E-05			
25.662	1.143	.2244E-05			
25.812	1.122	.1859E-05			
25.962	1.098	.1464E-05			
26.112	1.114	.1658E-05			
26.262	1.089	.1269E-05			
26.412	1.035	.4817E-06			
26.562	1.015	.2069E-06			
26.712	1.045	.5916E-06			
26.862	1.046	.5936E-06			
27.012	1.010	.1207E-06			
27.162	.966	-.4188E-06			
27.312	.969	-.3794E-06			
27.462	1.010	.1174E-06			
27.612	1.039	.4430E-06			
27.762	1.050	.5572E-06			
27.912	1.035	.3857E-06			
28.062	1.056	.5958E-06			
28.212	1.094	.9799E-06			
28.362	1.136	.1394E-05			
28.512	1.161	.1611E-05			
28.662	1.100	.9742E-06			
28.812	1.067	.6349E-06			
28.962	1.073	.6744E-06			
29.112	1.109	.9879E-06			
29.262	1.131	.1162E-05			
29.412	1.123	.1063E-05			
29.562	1.075	.6356E-06			
29.712	1.034	.2802E-06			
29.862	1.004	.2938E-07			
30.012	.999	-.1113E-07			

Table A3. Lidar Data Taken on May 9, 1983, at GMT 0733–0746 Between 42.1°N, 122.3°W and 43.5°N, 122.3°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
12.612	2.925	.2288E-03	18.462	3.670	.1274E-03
12.762	3.014	.2338E-03	18.612	3.369	.1106E-03
12.912	3.113	.2395E-03	18.762	3.126	.9698E-04
13.062	3.190	.2425E-03	18.912	2.956	.8724E-04
13.212	3.237	.2420E-03	19.062	2.764	.7693E-04
13.362	3.247	.2374E-03	19.212	2.579	.6730E-04
13.512	3.217	.2288E-03	19.362	2.429	.5956E-04
13.662	3.173	.2192E-03	19.512	2.281	.5216E-04
13.812	3.149	.2121E-03	19.662	2.258	.5009E-04
13.962	3.114	.2040E-03	19.812	2.482	.5769E-04
14.112	3.054	.1938E-03	19.962	2.852	.7046E-04
14.262	3.003	.1847E-03	20.112	3.195	.8167E-04
14.412	3.005	.1808E-03	20.262	3.495	.9072E-04
14.562	3.073	.1828E-03	20.412	3.359	.8387E-04
14.712	3.139	.1844E-03	20.562	2.655	.5751E-04
14.862	3.196	.1851E-03	20.712	2.160	.3940E-04
15.012	3.249	.1854E-03	20.862	2.079	.3580E-04
15.162	3.269	.1828E-03	21.012	2.018	.3298E-04
15.312	3.263	.1783E-03	21.162	1.926	.2931E-04
15.462	3.249	.1733E-03	21.312	1.828	.2560E-04
15.612	3.281	.1718E-03	21.462	1.730	.2206E-04
15.762	3.334	.1719E-03	21.612	1.644	.1902E-04
15.912	3.297	.1655E-03	21.762	1.588	.1697E-04
16.062	3.237	.1575E-03	21.912	1.578	.1628E-04
16.212	3.224	.1530E-03	22.062	1.589	.1623E-04
16.362	3.220	.1490E-03	22.212	1.559	.1503E-04
16.512	3.199	.1440E-03	22.362	1.478	.1255E-04
16.662	3.184	.1396E-03	22.512	1.488	.1254E-04
16.812	3.187	.1364E-03	22.662	1.606	.1522E-04
16.962	3.209	.1345E-03	22.812	1.705	.1729E-04
17.112	3.269	.1348E-03	22.962	1.791	.1894E-04
17.262	3.335	.1354E-03	23.112	1.828	.1937E-04
17.412	3.368	.1340E-03	23.262	1.751	.1716E-04
17.562	3.330	.1287E-03	23.412	1.678	.1514E-04
17.712	3.318	.1249E-03	23.562	1.639	.1395E-04
17.862	3.411	.1268E-03	23.712	1.617	.1314E-04
18.012	3.555	.1312E-03	23.862	1.630	.1313E-04
18.162	3.705	.1355E-03	24.012	1.729	.1482E-04
18.312	3.808	.1373E-03	24.162	1.862	.1711E-04

Table A3. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.312	1.930	.1804E-04	30.162	1.094	.7238E-06
24.462	1.894	.1692E-04	30.312	1.096	.7216E-06
24.612	1.701	.1297E-04	30.462	1.169	.1244E-05
24.762	1.444	.8018E-05	30.612	1.233	.1671E-05
24.912	1.317	.5579E-05	30.762	1.238	.1666E-05
25.062	1.252	.4334E-05	30.912	1.221	.1515E-05
25.212	1.190	.3201E-05	31.062	1.176	.1179E-05
25.362	1.151	.2485E-05	31.212	1.155	.1013E-05
25.512	1.114	.1828E-05			
25.662	1.122	.1906E-05			
25.812	1.128	.1956E-05			
25.962	1.107	.1589E-05			
26.112	1.057	.8269E-06			
26.262	1.032	.4598E-06			
26.412	1.024	.3284E-06			
26.562	1.055	.7430E-06			
26.712	1.029	.3827E-06			
26.862	.961	-.4998E-06			
27.012	.958	-.5297E-06			
27.162	1.006	.6825E-07			
27.312	1.046	.5561E-06			
27.462	1.035	.4152E-06			
27.612	1.038	.4324E-06			
27.762	1.055	.6148E-06			
27.912	1.093	.1024E-05			
28.062	1.180	.1928E-05			
28.212	1.204	.2135E-05			
28.362	1.146	.1489E-05			
28.512	1.163	.1632E-05			
28.662	1.198	.1932E-05			
28.812	1.192	.1828E-05			
28.962	1.193	.1799E-05			
29.112	1.182	.1652E-05			
29.262	1.187	.1663E-05			
29.412	1.124	.1076E-05			
29.562	1.098	.8313E-06			
29.712	1.150	.1237E-05			
29.862	1.186	.1501E-05			
30.012	1.163	.1282E-05			

Table A4. Lidar Data Taken on May 9, 1983, at GMT 1028–1041 Between 48.2°N, 124.4°W and 49.3°N, 126.1°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
12.612	3.498	.2869E-03	18.462	3.669	.1269E-03
12.762	3.564	.2878E-03	18.612	3.889	.1343E-03
12.912	3.639	.2895E-03	18.762	3.827	.1284E-03
13.062	3.696	.2891E-03	18.912	3.638	.1172E-03
13.212	3.710	.2839E-03	19.062	3.660	.1155E-03
13.362	3.710	.2775E-03	19.212	3.663	.1130E-03
13.512	3.730	.2733E-03	19.362	3.686	.1114E-03
13.662	3.749	.2691E-03	19.512	3.541	.1030E-03
13.812	3.674	.2560E-03	19.662	3.293	.9088E-04
13.962	3.513	.2353E-03	19.812	3.188	.8474E-04
14.112	3.462	.2253E-03	19.962	3.064	.7815E-04
14.262	3.561	.2292E-03	20.112	2.917	.7096E-04
14.412	3.629	.2301E-03	20.262	2.763	.6379E-04
14.562	3.613	.2237E-03	20.412	2.658	.5864E-04
14.712	3.619	.2192E-03	20.562	2.742	.6019E-04
14.862	3.617	.2142E-03	20.712	2.964	.6628E-04
15.012	3.595	.2077E-03	20.862	3.180	.7180E-04
15.162	3.572	.2012E-03	21.012	3.157	.6937E-04
15.312	3.507	.1918E-03	21.162	2.817	.5705E-04
15.462	3.363	.1768E-03	21.312	2.496	.4587E-04
15.612	3.173	.1589E-03	21.462	2.366	.4089E-04
15.762	3.061	.1475E-03	21.612	2.129	.3298E-04
15.912	3.052	.1436E-03	21.762	1.766	.2185E-04
16.062	3.067	.1414E-03	21.912	1.597	.1662E-04
16.212	3.111	.1412E-03	22.062	1.697	.1894E-04
16.362	3.176	.1422E-03	22.212	1.850	.2257E-04
16.512	3.261	.1445E-03	22.362	1.919	.2382E-04
16.662	3.356	.1471E-03	22.512	1.956	.2420E-04
16.812	3.433	.1485E-03	22.662	1.930	.2298E-04
16.962	3.483	.1482E-03	22.812	1.811	.1956E-04
17.112	3.568	.1498E-03	22.962	1.658	.1550E-04
17.262	3.710	.1545E-03	23.112	1.526	.1209E-04
17.412	3.830	.1578E-03	23.262	1.457	.1026E-04
17.562	3.846	.1551E-03	23.412	1.426	.9345E-05
17.712	3.809	.1497E-03	23.562	1.390	.8340E-05
17.862	3.774	.1445E-03	23.712	1.340	.7110E-05
18.012	3.681	.1365E-03	23.862	1.284	.5795E-05
18.162	3.522	.1255E-03	24.012	1.234	.4657E-05
18.312	3.491	.1212E-03	24.162	1.174	.3382E-05

Table A4. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.312	1.121	.2305E-05	30.162	.943	-.4365E-06
24.462	1.099	.1837E-05	30.312	.987	-.9720E-07
24.612	1.086	.1561E-05	30.462	1.058	.4302E-06
24.762	1.108	.1918E-05	30.612	1.129	.9268E-06
24.912	1.131	.2265E-05	30.762	1.133	.9360E-06
25.062	1.140	.2358E-05	30.912	1.045	.3094E-06
25.212	1.156	.2569E-05	31.062	1.068	.4605E-06
25.362	1.120	.1936E-05	31.212	1.202	.1327E-05
25.512	1.068	.1071E-05			
25.662	1.072	.1102E-05			
25.812	1.058	.8630E-06			
25.962	1.028	.4074E-06			
26.112	.978	-.3143E-06			
26.262	.958	-.5865E-06			
26.412	.993	-.9033E-07			
26.562	1.043	.5698E-06			
26.712	1.024	.3152E-06			
26.862	.991	-.1140E-06			
27.012	1.040	.4918E-06			
27.162	1.122	.1478E-05			
27.312	1.189	.2244E-05			
27.462	1.150	.1739E-05			
27.612	1.072	.8149E-06			
27.762	1.078	.8693E-06			
27.912	1.118	.1279E-05			
28.062	1.098	.1042E-05			
28.212	1.075	.7785E-06			
28.362	1.059	.5933E-06			
28.512	1.060	.5960E-06			
28.662	1.092	.8862E-06			
28.812	1.076	.7228E-06			
28.962	1.055	.5098E-06			
29.112	1.062	.5640E-06			
29.262	1.036	.3173E-06			
29.412	.998	-.1784E-07			
29.562	1.023	.1923E-06			
29.712	1.063	.5199E-06			
29.862	1.062	.5021E-06			
30.012	1.002	.1731E-07			

Table A5. Lidar Data Taken on May 9, 1983, at GMT 1055–1108 Between 50.5°N, 128.0°W and 51.8°N, 129.7°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
12.612	3.227	.2557E-03	18.462	3.389	.1136E-03
12.762	3.276	.2555E-03	18.612	3.041	.9487E-04
12.912	3.319	.2544E-03	18.762	2.812	.8232E-04
13.062	3.368	.2538E-03	18.912	2.645	.7306E-04
13.212	3.403	.2518E-03	19.062	2.633	.7087E-04
13.362	3.416	.2474E-03	19.212	2.770	.7509E-04
13.512	3.498	.2501E-03	19.362	2.915	.7944E-04
13.662	3.604	.2549E-03	19.512	2.791	.7259E-04
13.812	3.620	.2508E-03	19.662	2.588	.6294E-04
13.962	3.576	.2412E-03	19.812	2.555	.6023E-04
14.112	3.449	.2242E-03	19.962	2.578	.5974E-04
14.262	3.270	.2032E-03	20.112	2.665	.6164E-04
14.412	3.204	.1929E-03	20.262	2.506	.5448E-04
14.562	3.295	.1964E-03	20.412	2.103	.3899E-04
14.712	3.432	.2035E-03	20.562	1.885	.3059E-04
14.862	3.487	.2036E-03	20.712	1.850	.2867E-04
15.012	3.429	.1944E-03	20.862	1.795	.2621E-04
15.162	3.439	.1908E-03	21.012	1.757	.2435E-04
15.312	3.522	.1930E-03	21.162	1.759	.2385E-04
15.462	3.537	.1898E-03	21.312	1.806	.2471E-04
15.612	3.548	.1864E-03	21.462	1.884	.2647E-04
15.762	3.578	.1844E-03	21.612	1.952	.2782E-04
15.912	3.507	.1754E-03	21.762	2.028	.2934E-04
16.062	3.355	.1611E-03	21.912	2.002	.2791E-04
16.212	3.187	.1462E-03	22.062	1.754	.2049E-04
16.362	3.087	.1364E-03	22.212	1.433	.1149E-04
16.512	3.080	.1329E-03	22.362	1.261	.6767E-05
16.662	3.113	.1320E-03	22.512	1.241	.6108E-05
16.812	3.157	.1317E-03	22.662	1.266	.6575E-05
16.962	3.188	.1306E-03	22.812	1.376	.9065E-05
17.112	3.264	.1321E-03	22.962	1.425	.1001E-04
17.262	3.400	.1369E-03	23.112	1.385	.8862E-05
17.412	3.515	.1402E-03	23.262	1.454	.1019E-04
17.562	3.567	.1399E-03	23.412	1.528	.1157E-04
17.712	3.597	.1383E-03	23.562	1.481	.1029E-04
17.862	3.657	.1384E-03	23.712	1.404	.8445E-05
18.012	3.721	.1385E-03	23.862	1.342	.6972E-05
18.162	3.729	.1358E-03	24.012	1.321	.6389E-05
18.312	3.674	.1301E-03	24.162	1.299	.5813E-05

Table A5. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.312	1.283	.5368E-05	30.162	1.205	.1578E-05
24.462	1.309	.5723E-05	30.312	1.136	.1027E-05
24.612	1.300	.5433E-05	30.462	1.082	.6047E-06
24.762	1.239	.4234E-05	30.612	1.163	.1173E-05
24.912	1.212	.3654E-05	30.762	1.291	.2048E-05
25.062	1.222	.3745E-05	30.912	1.319	.2195E-05
25.212	1.201	.3303E-05	31.062	1.259	.1743E-05
25.362	1.146	.2348E-05	31.212	1.264	.1738E-05
25.512	1.125	.1970E-05			
25.662	1.132	.2024E-05			
25.812	1.095	.1420E-05			
25.962	1.075	.1097E-05			
26.112	1.064	.9094E-06			
26.262	.999	-.1651E-07			
26.412	.949	-.7000E-06			
26.562	.973	-.3632E-06			
26.712	1.016	.2108E-06			
26.862	1.033	.4178E-06			
27.012	1.033	.4072E-06			
27.162	1.016	.1938E-06			
27.312	1.038	.4460E-06			
27.462	1.073	.8454E-06			
27.612	1.070	.7999E-06			
27.762	1.102	.1131E-05			
27.912	1.106	.1148E-05			
28.062	1.062	.6548E-06			
28.212	1.086	.8868E-06			
28.362	1.118	.1197E-05			
28.512	1.091	.9059E-06			
28.662	1.081	.7828E-06			
28.812	1.058	.5468E-06			
28.962	1.034	.3190E-06			
29.112	1.036	.3275E-06			
29.262	1.054	.4739E-06			
29.412	1.093	.8009E-06			
29.562	1.080	.6787E-06			
29.712	1.056	.4663E-06			
29.862	1.065	.5216E-06			
30.012	1.139	.1094E-05			

Table A6. Lidar Data Taken on May 9, 1983, at GMT 1145–1154 Between 55.5°N, 134.0°W and 56.5°N, 135.1°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
12.612	3.481	.2849E-03	18.462	2.588	.7549E-04
12.762	3.510	.2817E-03	18.612	2.610	.7485E-04
12.912	3.559	.2807E-03	18.762	2.839	.8357E-04
13.062	3.605	.2793E-03	18.912	3.263	.1005E-03
13.212	3.666	.2794E-03	19.062	3.625	.1139E-03
13.362	3.690	.2754E-03	19.212	3.500	.1061E-03
13.512	3.639	.2642E-03	19.362	3.106	.8732E-04
13.662	3.556	.2503E-03	19.512	2.898	.7693E-04
13.812	3.486	.2380E-03	19.662	2.984	.7862E-04
13.962	3.460	.2303E-03	19.812	3.131	.8253E-04
14.112	3.426	.2221E-03	19.962	3.192	.8301E-04
14.262	3.399	.2147E-03	20.112	3.279	.8433E-04
14.412	3.494	.2183E-03	20.262	3.242	.8112E-04
14.562	3.648	.2266E-03	20.412	2.980	.7001E-04
14.712	3.698	.2258E-03	20.562	2.769	.6113E-04
14.862	3.634	.2155E-03	20.712	2.554	.5244E-04
15.012	3.637	.2110E-03	20.862	2.264	.4165E-04
15.162	3.701	.2113E-03	21.012	2.063	.3420E-04
15.312	3.657	.2033E-03	21.162	1.946	.2971E-04
15.462	3.574	.1926E-03	21.312	1.790	.2421E-04
15.612	3.544	.1861E-03	21.462	1.667	.1997E-04
15.762	3.584	.1848E-03	21.612	1.783	.2287E-04
15.912	3.617	.1831E-03	21.762	2.009	.2877E-04
16.062	3.646	.1810E-03	21.912	2.102	.3068E-04
16.212	3.677	.1790E-03	22.062	1.994	.2702E-04
16.362	3.705	.1768E-03	22.212	1.811	.2152E-04
16.512	3.754	.1760E-03	22.362	1.671	.1740E-04
16.662	3.838	.1772E-03	22.512	1.608	.1540E-04
16.812	3.888	.1764E-03	22.662	1.606	.1497E-04
16.962	3.860	.1707E-03	22.812	1.586	.1413E-04
17.112	3.755	.1607E-03	22.962	1.501	.1179E-04
17.262	3.631	.1500E-03	23.112	1.424	.9757E-05
17.412	3.556	.1425E-03	23.262	1.350	.7852E-05
17.562	3.474	.1348E-03	23.412	1.338	.7411E-05
17.712	3.325	.1239E-03	23.562	1.378	.8096E-05
17.862	3.116	.1102E-03	23.712	1.392	.8188E-05
18.012	2.898	.9663E-04	23.862	1.291	.5929E-05
18.162	2.784	.8876E-04	24.012	1.137	.2725E-05
18.312	2.737	.8449E-04	24.162	1.054	.1051E-05

Table A6. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.312	1.029	.5414E-06	30.162	1.180	.1390E-05
24.462	1.067	.1250E-05	30.312	1.159	.1199E-05
24.612	1.139	.2526E-05	30.462	1.167	.1232E-05
24.762	1.156	.2756E-05	30.612	1.158	.1136E-05
24.912	1.100	.1731E-05	30.762	1.175	.1233E-05
25.062	1.067	.1124E-05	30.912	1.194	.1333E-05
25.212	1.065	.1078E-05	31.062	1.193	.1301E-05
25.362	1.113	.1825E-05	31.212	1.188	.1234E-05
25.512	1.179	.2816E-05			
25.662	1.174	.2669E-05			
25.812	1.135	.2016E-05			
25.962	1.051	.7420E-06			
26.112	.983	-.2371E-06			
26.262	1.013	.1850E-06			
26.412	1.031	.4259E-06			
26.562	1.005	.7144E-07			
26.712	.958	-.5449E-06			
26.862	.957	-.5405E-06			
27.012	.957	-.5364E-06			
27.162	.993	-.8156E-07			
27.312	1.028	.3284E-06			
27.462	.974	-.2972E-06			
27.612	.969	-.3466E-06			
27.762	.954	-.5070E-06			
27.912	.948	-.5614E-06			
28.062	1.050	.5295E-06			
28.212	1.078	.8089E-06			
28.362	1.034	.3447E-06			
28.512	1.015	.1452E-06			
28.662	1.025	.2456E-06			
28.812	1.065	.6155E-06			
28.962	1.103	.9554E-06			
29.112	1.122	.1102E-05			
29.262	1.102	.9030E-06			
29.412	1.071	.6130E-06			
29.562	1.124	.1045E-05			
29.712	1.178	.1470E-05			
29.862	1.218	.1760E-05			
30.012	1.224	.1769E-05			

Table A7. Lidar Data Taken on May 9, 1983, at GMT 1218–1229 Between 58.7°N, 138.2°W and 59.7°N, 139.8°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.831	3.587	.2490E-03	19.681	3.070	.8068E-04
13.981	3.640	.2483E-03	19.831	3.099	.7996E-04
14.131	3.615	.2403E-03	19.981	2.875	.6976E-04
14.281	3.551	.2291E-03	20.131	2.628	.5922E-04
14.431	3.539	.2228E-03	20.281	2.389	.4937E-04
14.581	3.550	.2187E-03	20.431	2.107	.3843E-04
14.731	3.539	.2127E-03	20.581	1.853	.2893E-04
14.881	3.535	.2075E-03	20.731	1.780	.2583E-04
15.031	3.502	.2002E-03	20.881	1.749	.2422E-04
15.181	3.474	.1935E-03	21.031	1.832	.2629E-04
15.331	3.561	.1957E-03	21.181	2.027	.3169E-04
15.481	3.677	.1999E-03	21.331	2.125	.3391E-04
15.631	3.751	.2007E-03	21.481	2.086	.3196E-04
15.781	3.838	.2024E-03	21.631	1.989	.2844E-04
15.931	3.877	.2005E-03	21.781	1.879	.2468E-04
16.081	3.878	.1960E-03	21.931	1.820	.2248E-04
16.231	3.903	.1931E-03	22.081	1.711	.1905E-04
16.381	3.930	.1904E-03	22.231	1.547	.1430E-04
16.531	3.937	.1864E-03	22.381	1.458	.1169E-04
16.681	3.854	.1770E-03	22.531	1.422	.1053E-04
16.831	3.759	.1672E-03	22.681	1.403	.9827E-05
16.981	3.737	.1620E-03	22.831	1.394	.9390E-05
17.131	3.733	.1580E-03	22.981	1.409	.9498E-05
17.281	3.731	.1543E-03	23.131	1.463	.1051E-04
17.431	3.701	.1491E-03	23.281	1.487	.1081E-04
17.581	3.643	.1425E-03	23.431	1.449	.9725E-05
17.731	3.495	.1314E-03	23.581	1.412	.8720E-05
17.881	3.240	.1153E-03	23.731	1.331	.6833E-05
18.031	3.062	.1037E-03	23.881	1.213	.4307E-05
18.181	3.077	.1020E-03	24.031	1.118	.2335E-05
18.331	3.122	.1018E-03	24.181	1.066	.1271E-05
18.481	3.273	.1066E-03	24.331	1.067	.1259E-05
18.631	3.501	.1146E-03	24.481	1.024	.4465E-06
18.781	3.397	.1073E-03	24.631	.993	-.1219E-06
18.931	2.993	.8718E-04	24.781	.990	-.1685E-06
19.081	2.469	.6278E-04	24.931	.966	-.5875E-06
19.231	2.122	.4689E-04	25.081	.998	-.2794E-07
19.381	2.242	.5069E-04	25.231	1.052	.8556E-06
19.531	2.685	.6723E-04	25.381	1.081	.1289E-05

Table A7. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
25.531	1.070	.1092E-05			
25.681	1.059	.8940E-06			
25.831	1.034	.5012E-06			
25.981	1.014	.2021E-06			
26.131	1.063	.8915E-06			
26.281	1.068	.9430E-06			
26.431	1.053	.7138E-06			
26.581	1.016	.2110E-06			
26.731	.988	-.1559E-06			
26.881	1.006	.7346E-07			
27.031	.987	-.1538E-06			
27.181	.987	-.1585E-06			
27.331	.989	-.1233E-06			
27.481	.968	-.3617E-06			
27.631	.972	-.3159E-06			
27.781	1.005	.4975E-07			
27.931	1.097	.1038E-05			
28.081	1.114	.1190E-05			
28.231	1.036	.3676E-06			
28.381	1.035	.3445E-06			
28.531	1.102	.9927E-06			
28.681	1.102	.9726E-06			
28.831	1.103	.9521E-06			
28.981	1.095	.8605E-06			
29.131	1.047	.4137E-06			
29.281	.955	-.3886E-06			
29.431	1.005	.3801E-07			
29.581	1.117	.9681E-06			
29.731	1.186	.1497E-05			
29.881	1.147	.1161E-05			
30.031	1.007	.5566E-07			
30.181	1.068	.5122E-06			
30.331	1.195	.1428E-05			
30.481	1.293	.2097E-05			
30.631	1.358	.2504E-05			
30.781	1.294	.2007E-05			
30.931	1.162	.1084E-05			
31.081	1.154	.1005E-05			

Table A8. Lidar Data Taken on May 9, 1983, at GMT 1357–1417 Between 69.2°N, 150.9°W and 71.0°N, 155.9°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.831	3.475	.2372E-03	19.681	2.262	.4891E-04
13.981	3.687	.2517E-03	19.831	2.228	.4649E-04
14.131	3.826	.2587E-03	19.981	2.109	.4102E-04
14.281	3.848	.2548E-03	20.131	1.996	.3599E-04
14.431	3.817	.2464E-03	20.281	1.940	.3318E-04
14.581	3.793	.2388E-03	20.431	1.909	.3136E-04
14.731	3.740	.2289E-03	20.581	1.858	.2892E-04
14.881	3.719	.2220E-03	20.731	1.727	.2394E-04
15.031	3.678	.2137E-03	20.881	1.599	.1927E-04
15.181	3.529	.1973E-03	21.031	1.516	.1623E-04
15.331	3.345	.1788E-03	21.181	1.458	.1407E-04
15.481	3.179	.1624E-03	21.331	1.457	.1371E-04
15.631	3.141	.1559E-03	21.481	1.466	.1367E-04
15.781	3.266	.1614E-03	21.631	1.415	.1190E-04
15.931	3.399	.1669E-03	21.781	1.429	.1203E-04
16.081	3.416	.1643E-03	21.931	1.454	.1244E-04
16.231	3.368	.1572E-03	22.081	1.450	.1204E-04
16.381	3.219	.1439E-03	22.231	1.454	.1188E-04
16.531	3.030	.1286E-03	22.381	1.409	.1045E-04
16.681	3.018	.1249E-03	22.531	1.406	.1015E-04
16.831	3.114	.1278E-03	22.681	1.421	.1026E-04
16.981	3.189	.1293E-03	22.831	1.383	.9137E-05
17.131	3.350	.1356E-03	22.981	1.353	.8223E-05
17.281	3.358	.1329E-03	23.131	1.306	.6972E-05
17.431	3.237	.1232E-03	23.281	1.237	.5267E-05
17.581	3.422	.1302E-03	23.431	1.156	.3399E-05
17.731	3.556	.1342E-03	23.581	1.123	.2607E-05
17.881	3.386	.1224E-03	23.731	1.135	.2798E-05
18.031	3.292	.1149E-03	23.881	1.096	.1945E-05
18.181	3.197	.1075E-03	24.031	1.055	.1099E-05
18.331	3.153	.1030E-03	24.181	1.079	.1521E-05
18.481	3.134	.9970E-04	24.331	1.085	.1608E-05
18.631	3.000	.9131E-04	24.481	1.058	.1069E-05
18.781	2.778	.7930E-04	24.631	1.019	.3462E-06
18.931	2.555	.6772E-04	24.781	1.025	.4321E-06
19.081	2.412	.6011E-04	24.931	1.062	.1069E-05
19.231	2.421	.5909E-04	25.081	1.110	.1839E-05
19.381	2.509	.6129E-04	25.231	1.086	.1404E-05
19.531	2.474	.5850E-04	25.381	1.052	.8320E-06

Table A8. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
25.531	1.095	.1483E-05			
25.681	1.108	.1646E-05			
25.831	1.049	.7296E-06			
25.981	.983	-.2537E-06			
26.131	1.002	.3096E-07			
26.281	1.066	.9228E-06			
26.431	1.065	.8817E-06			
26.581	1.064	.8419E-06			
26.731	.990	-.1279E-06			
26.881	.964	-.4554E-06			
27.031	1.007	.8243E-07			
27.181	1.034	.4131E-06			
27.331	1.013	.1476E-06			
27.481	.964	-.4127E-06			
27.631	.896	-.1164E-05			
27.781	.988	-.1271E-06			
27.931	1.138	.1484E-05			
28.081	1.169	.1770E-05			
28.231	.999	-.9310E-08			
28.381	.912	-.8776E-06			
28.531	1.068	.6676E-06			
28.681	1.148	.1410E-05			
28.831	1.138	.1283E-05			
28.981	1.117	.1062E-05			
29.131	1.257	.2282E-05			
29.281	1.300	.2600E-05			
29.431	1.239	.2024E-05			
29.581	1.119	.9842E-06			
29.731	1.126	.1015E-05			
29.881	1.292	.2304E-05			
30.031	1.220	.1694E-05			
30.181	1.061	.4558E-06			
30.331	.890	-.8058E-06			
30.481	.962	-.2741E-06			
30.631	1.143	.1002E-05			
30.781	1.086	.5926E-06			
30.931	1.276	.1851E-05			

Table A9. Lidar Data Taken on May 11, 1983, at GMT 1556–1623 Between 55.4°N, 156.7°W and 51.9°N, 155.5°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.221	4.425	.3678E-03	19.071	4.198	.1403E-03
13.371	4.436	.3602E-03	19.221	4.049	.1307E-03
13.521	4.431	.3510E-03	19.371	3.470	.1034E-03
13.671	4.420	.3420E-03	19.521	2.979	.8093E-04
13.821	4.434	.3358E-03	19.671	2.689	.6749E-04
13.971	4.462	.3311E-03	19.821	2.576	.6151E-04
14.121	4.465	.3241E-03	19.971	2.470	.5602E-04
14.271	4.404	.3114E-03	20.121	2.337	.4977E-04
14.421	4.320	.2970E-03	20.271	2.290	.4691E-04
14.571	4.272	.2863E-03	20.421	2.330	.4727E-04
14.721	4.222	.2757E-03	20.571	2.358	.4715E-04
14.871	4.161	.2646E-03	20.721	2.321	.4479E-04
15.021	4.113	.2548E-03	20.871	2.236	.4095E-04
15.171	4.083	.2468E-03	21.021	2.067	.3453E-04
15.321	4.061	.2396E-03	21.171	2.064	.3364E-04
15.471	3.994	.2292E-03	21.321	2.169	.3612E-04
15.621	3.906	.2176E-03	21.471	2.162	.3509E-04
15.771	3.835	.2077E-03	21.621	2.019	.3007E-04
15.921	3.813	.2015E-03	21.771	1.812	.2341E-04
16.071	3.884	.2020E-03	21.921	1.695	.1957E-04
16.221	3.968	.2034E-03	22.071	1.631	.1736E-04
16.371	3.985	.1998E-03	22.221	1.569	.1530E-04
16.521	3.946	.1926E-03	22.371	1.538	.1414E-04
16.671	3.908	.1857E-03	22.521	1.539	.1383E-04
16.821	3.949	.1839E-03	22.671	1.540	.1356E-04
16.971	3.985	.1819E-03	22.821	1.543	.1332E-04
17.121	3.965	.1765E-03	22.971	1.503	.1204E-04
17.271	3.937	.1707E-03	23.121	1.402	.9419E-05
17.421	3.912	.1653E-03	23.271	1.313	.7169E-05
17.571	3.901	.1609E-03	23.421	1.316	.7062E-05
17.721	3.936	.1591E-03	23.571	1.299	.6535E-05
17.871	3.995	.1585E-03	23.721	1.211	.4501E-05
18.021	3.996	.1549E-03	23.871	1.186	.3882E-05
18.171	3.931	.1480E-03	24.021	1.228	.4645E-05
18.321	3.844	.1403E-03	24.171	1.183	.3645E-05
18.471	3.801	.1350E-03	24.321	1.192	.3728E-05
18.621	3.813	.1324E-03	24.471	1.340	.6455E-05
18.771	3.847	.1309E-03	24.621	1.314	.5824E-05
18.921	3.983	.1340E-03	24.771	1.187	.3383E-05

Table A9. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.921	1.109	.1924E-05	30.771	1.342	.2456E-05
25.071	1.196	.3392E-05	30.921	1.585	.4104E-05
25.221	1.282	.4771E-05	31.071	1.921	.6315E-05
25.371	1.248	.4100E-05	31.221	1.477	.3198E-05
25.521	1.119	.1914E-05	31.371	1.098	.6404E-06
25.671	1.080	.1268E-05	31.521	1.159	.1015E-05
25.821	1.132	.2034E-05			
25.971	1.134	.2008E-05			
26.121	1.253	.3720E-05			
26.271	1.427	.6134E-05			
26.421	1.557	.7812E-05			
26.571	1.449	.6154E-05			
26.721	1.213	.2851E-05			
26.871	1.093	.1220E-05			
27.021	1.279	.3565E-05			
27.171	1.315	.3930E-05			
27.321	1.166	.2031E-05			
27.471	1.028	.3297E-06			
27.621	1.076	.8870E-06			
27.771	1.014	.1625E-06			
27.921	.861	-.1548E-05			
28.071	1.024	.2612E-06			
28.221	1.025	.2629E-06			
28.371	.871	-.1342E-05			
28.521	1.069	.7002E-06			
28.671	1.270	.2674E-05			
28.821	1.183	.1769E-05			
28.971	.987	-.1244E-06			
29.121	.771	-.2118E-05			
29.271	1.102	.9218E-06			
29.421	1.586	.5178E-05			
29.571	1.201	.1735E-05			
29.721	.709	-.2453E-05			
29.871	.723	-.2284E-05			
30.021	1.129	.1043E-05			
30.171	1.253	.1992E-05			
30.321	1.311	.2391E-05			
30.471	1.413	.3107E-05			
30.621	1.351	.2576E-05			

Table A10. Lidar Data Taken on May 11, 1983, at GMT 1714–1743 Between 44.5°N, 152.5°W and 40.4°N, 151.8°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.282	2.461	.1626E-03	19.132	2.604	.7043E-04
13.432	2.390	.1508E-03	19.282	2.943	.8336E-04
13.582	2.307	.1383E-03	19.432	3.467	.1034E-03
13.732	2.295	.1337E-03	19.582	3.612	.1069E-03
13.882	2.391	.1402E-03	19.732	3.307	.9224E-04
14.032	2.584	.1559E-03	19.882	3.075	.8102E-04
14.182	2.734	.1666E-03	20.032	3.308	.8801E-04
14.332	2.806	.1695E-03	20.182	3.466	.9187E-04
14.482	2.896	.1738E-03	20.332	3.226	.8100E-04
14.632	3.006	.1795E-03	20.482	3.048	.7278E-04
14.782	3.048	.1790E-03	20.632	2.866	.6479E-04
14.932	2.939	.1655E-03	20.782	2.573	.5333E-04
15.082	2.717	.1430E-03	20.932	2.341	.4447E-04
15.232	2.454	.1183E-03	21.082	2.219	.3949E-04
15.382	2.239	.9842E-04	21.232	2.186	.3754E-04
15.532	2.101	.8546E-04	21.382	2.166	.3608E-04
15.682	2.038	.7864E-04	21.532	2.063	.3215E-04
15.832	1.988	.7310E-04	21.682	1.961	.2840E-04
15.982	1.950	.6861E-04	21.832	1.937	.2707E-04
16.132	1.989	.6976E-04	21.982	1.914	.2580E-04
16.282	2.066	.7342E-04	22.132	1.832	.2297E-04
16.432	2.166	.7847E-04	22.282	1.802	.2163E-04
16.582	2.294	.8498E-04	22.432	1.782	.2060E-04
16.732	2.455	.9336E-04	22.582	1.661	.1703E-04
16.882	2.623	.1017E-03	22.732	1.506	.1275E-04
17.032	2.795	.1098E-03	22.882	1.416	.1023E-04
17.182	2.945	.1162E-03	23.032	1.395	.9510E-05
17.332	3.056	.1199E-03	23.182	1.379	.8906E-05
17.482	3.225	.1268E-03	23.332	1.333	.7653E-05
17.632	3.352	.1308E-03	23.482	1.273	.6138E-05
17.782	3.354	.1279E-03	23.632	1.106	.2333E-05
17.932	3.183	.1158E-03	23.782	1.086	.1835E-05
18.082	3.086	.1081E-03	23.932	1.181	.3788E-05
18.232	3.124	.1074E-03	24.082	1.123	.2523E-05
18.382	3.082	.1028E-03	24.232	1.072	.1435E-05
18.532	2.922	.9273E-04	24.382	1.078	.1528E-05
18.682	2.685	.7939E-04	24.532	1.029	.5444E-06
18.832	2.618	.7449E-04	24.682	.914	-.1606E-05
18.982	2.664	.7481E-04	24.832	.908	-.1670E-05

Table A10. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.982	.876	-.2214E-05	30.832	.819	-.1298E-05
25.132	.797	-.3529E-05	30.982	.720	-.1964E-05
25.282	.950	-.8547E-06	31.132	.698	-.2070E-05
25.432	1.077	.1274E-05	31.282	.930	-.4688E-06
25.582	.969	-.4981E-06	31.432	.743	-.1682E-05
25.732	.819	-.2866E-05			
25.882	.845	-.2395E-05			
26.032	1.021	.3109E-06			
26.182	.996	-.5413E-07			
26.332	.869	-.1888E-05			
26.482	.847	-.2157E-05			
26.632	.937	-.8610E-06			
26.782	.996	-.5707E-07			
26.932	1.033	.4333E-06			
27.082	.886	-.1463E-05			
27.232	.750	-.3141E-05			
27.382	1.052	.6379E-06			
27.532	1.279	.3346E-05			
27.682	1.039	.4619E-06			
27.832	.979	-.2445E-06			
27.982	1.047	.5304E-06			
28.132	1.013	.1436E-06			
28.282	1.280	.2990E-05			
28.432	1.183	.1912E-05			
28.582	.908	-.9386E-06			
28.732	1.024	.2416E-06			
28.882	1.026	.2501E-06			
29.032	.935	-.6209E-06			
29.182	.956	-.4083E-06			
29.332	1.050	.4514E-06			
29.482	1.120	.1059E-05			
29.632	1.551	.4773E-05			
29.782	1.707	.5977E-05			
29.932	1.203	.1679E-05			
30.082	1.208	.1676E-05			
30.232	1.102	.8018E-06			
30.382	.500	-.3856E-05			
30.532	.528	-.3558E-05			
30.682	.649	-.2580E-05			

Table A11. Lidar Data Taken on May 11, 1983, at GMT 1927–1947 Between 27.6°N, 154.3°W and 25.6°N, 156.0°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
14.897	2.626	.1601E-03	20.747	4.619	.1300E-03
15.047	2.544	.1486E-03	20.897	4.437	.1203E-03
15.197	2.557	.1464E-03	21.047	4.087	.1054E-03
15.347	2.332	.1224E-03	21.197	4.182	.1059E-03
15.497	1.934	.8384E-04	21.347	4.241	.1052E-03
15.647	1.682	.5982E-04	21.497	3.937	.9296E-04
15.797	1.617	.5290E-04	21.647	3.754	.8499E-04
15.947	1.559	.4682E-04	21.797	3.599	.7819E-04
16.097	1.526	.4304E-04	21.947	3.179	.6393E-04
16.247	1.552	.4417E-04	22.097	2.777	.5083E-04
16.397	1.556	.4348E-04	22.247	2.514	.4222E-04
16.547	1.518	.3953E-04	22.397	2.368	.3721E-04
16.697	1.545	.4055E-04	22.547	2.521	.4033E-04
16.847	1.629	.4553E-04	22.697	2.788	.4622E-04
16.997	1.819	.5776E-04	22.847	2.860	.4687E-04
17.147	2.156	.7935E-04	22.997	2.714	.4213E-04
17.297	2.501	.1003E-03	23.147	2.693	.4057E-04
17.447	2.874	.1219E-03	23.297	2.946	.4545E-04
17.597	3.324	.1471E-03	23.447	3.278	.5188E-04
17.747	3.675	.1649E-03	23.597	3.195	.4876E-04
17.897	3.875	.1725E-03	23.747	2.543	.3341E-04
18.047	3.942	.1719E-03	23.897	2.059	.2235E-04
18.197	3.960	.1683E-03	24.047	1.876	.1804E-04
18.347	3.921	.1618E-03	24.197	1.760	.1528E-04
18.497	3.808	.1514E-03	24.347	1.686	.1344E-04
18.647	3.706	.1420E-03	24.497	1.603	.1153E-04
18.797	3.768	.1414E-03	24.647	1.481	.8971E-05
18.947	3.877	.1430E-03	24.797	1.348	.6334E-05
19.097	3.912	.1409E-03	24.947	1.363	.6450E-05
19.247	4.028	.1426E-03	25.097	1.504	.8735E-05
19.397	4.251	.1490E-03	25.247	1.461	.7784E-05
19.547	4.532	.1576E-03	25.397	1.363	.5985E-05
19.697	4.845	.1669E-03	25.547	1.381	.6122E-05
19.847	4.987	.1685E-03	25.697	1.441	.6917E-05
19.997	4.887	.1599E-03	25.847	1.437	.6695E-05
20.147	4.641	.1457E-03	25.997	1.273	.4079E-05
20.297	4.390	.1321E-03	26.147	1.249	.3624E-05
20.447	4.332	.1263E-03	26.297	1.249	.3542E-05
20.597	4.466	.1279E-03	26.447	1.182	.2529E-05

Table A11. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
26.597	1.083	.1130E-05			
26.747	1.022	.2963E-06			
26.897	.936	-.8229E-06			
27.047	.986	-.1735E-06			
27.197	.972	-.3494E-06			
27.347	.957	-.5140E-06			
27.497	1.033	.3896E-06			
27.647	.941	-.6742E-06			
27.797	1.070	.7882E-06			
27.947	1.177	.1936E-05			
28.097	1.204	.2181E-05			
28.247	.979	-.2204E-06			
28.397	.864	-.1389E-05			
28.547	1.102	.1021E-05			
28.697	1.303	.2953E-05			
28.847	1.310	.2954E-05			
28.997	1.152	.1413E-05			
29.147	.862	-.1254E-05			
29.297	.724	-.2448E-05			
29.447	.880	-.1036E-05			
29.597	.949	-.4349E-06			
29.747	.939	-.5054E-06			
29.897	.896	-.8436E-06			
30.047	.940	-.4771E-06			
30.197	.987	-.1004E-06			
30.347	1.294	.2215E-05			
30.497	1.150	.1105E-05			
30.647	1.096	.6926E-06			
30.797	1.498	.3493E-05			
30.947	1.674	.4625E-05			
31.097	1.298	.1994E-05			
31.247	1.449	.2938E-05			

Table A12. Lidar Data Taken on May 11, 1983, at GMT 1947–2010 Between 25.6°N, 156.0°W and 22.9°N, 156.8°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
14.897	1.583	.5739E-04	20.747	4.585	.1288E-03
15.047	1.639	.6150E-04	20.897	4.586	.1256E-03
15.197	1.775	.7285E-04	21.047	4.556	.1214E-03
15.347	1.961	.8834E-04	21.197	4.424	.1140E-03
15.497	2.124	.1009E-03	21.347	4.065	.9948E-04
15.647	2.199	.1052E-03	21.497	3.702	.8551E-04
15.797	2.204	.1032E-03	21.647	3.507	.7734E-04
15.947	2.298	.1087E-03	21.797	3.276	.6848E-04
16.097	2.417	.1160E-03	21.947	2.942	.5698E-04
16.247	2.486	.1188E-03	22.097	2.881	.5380E-04
16.397	2.640	.1281E-03	22.247	3.173	.6060E-04
16.547	2.754	.1339E-03	22.397	3.389	.6497E-04
16.697	2.677	.1247E-03	22.547	3.593	.6876E-04
16.847	2.581	.1145E-03	22.697	3.727	.7049E-04
16.997	2.625	.1146E-03	22.847	3.724	.6866E-04
17.147	2.802	.1237E-03	22.997	3.796	.6871E-04
17.297	3.026	.1354E-03	23.147	3.821	.6760E-04
17.447	3.339	.1522E-03	23.297	3.720	.6356E-04
17.597	3.610	.1653E-03	23.447	3.321	.5288E-04
17.747	3.667	.1644E-03	23.597	2.875	.4165E-04
17.897	3.630	.1578E-03	23.747	2.418	.3071E-04
18.047	3.576	.1505E-03	23.897	1.981	.2071E-04
18.197	3.465	.1402E-03	24.047	1.634	.1306E-04
18.347	3.219	.1229E-03	24.197	1.473	.9492E-05
18.497	2.995	.1076E-03	24.347	1.447	.8765E-05
18.647	2.971	.1034E-03	24.497	1.324	.6191E-05
18.797	3.048	.1046E-03	24.647	1.267	.4973E-05
18.947	3.183	.1085E-03	24.797	1.076	.1379E-05
19.097	3.402	.1162E-03	24.947	.901	-.1752E-05
19.247	3.718	.1280E-03	25.097	.864	-.2349E-05
19.397	4.005	.1377E-03	25.247	.993	-.1167E-06
19.547	4.275	.1461E-03	25.397	1.165	.2727E-05
19.697	4.500	.1520E-03	25.547	1.230	.3701E-05
19.847	4.416	.1444E-03	25.697	1.305	.4795E-05
19.997	4.164	.1301E-03	25.847	1.274	.4193E-05
20.147	4.139	.1256E-03	25.997	1.268	.4008E-05
20.297	4.392	.1322E-03	26.147	1.260	.3786E-05
20.447	4.560	.1350E-03	26.297	1.140	.1988E-05
20.597	4.608	.1332E-03	26.447	1.126	.1747E-05

Table A12. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
26.597	1.206	.2789E-05			
26.747	1.358	.4725E-05			
26.897	1.230	.2968E-05			
27.047	.964	-.4513E-06			
27.197	1.057	.7055E-06			
27.347	1.229	.2750E-05			
27.497	1.257	.3015E-05			
27.647	1.167	.1913E-05			
27.797	1.414	.4645E-05			
27.947	1.364	.3988E-05			
28.097	1.080	.8589E-06			
28.247	1.177	.1855E-05			
28.397	1.271	.2764E-05			
28.547	1.115	.1150E-05			
28.697	.996	-.4233E-07			
28.847	1.329	.3134E-05			
28.997	1.822	.7645E-05			
29.147	1.599	.5438E-05			
29.297	1.298	.2646E-05			
29.447	1.176	.1522E-05			
29.597	1.418	.3540E-05			
29.747	1.607	.5016E-05			
29.897	1.686	.5541E-05			
30.047	1.630	.4969E-05			
30.197	1.375	.2895E-05			
30.347	1.142	.1069E-05			
30.497	.774	-.1660E-05			
30.647	.831	-.1217E-05			
30.797	1.146	.1024E-05			
30.947	1.219	.1505E-05			
31.097	1.132	.8872E-06			
31.247	1.166	.1090E-05			

Table A13. Lidar Data Taken on May 12, 1983, at GMT 1509–1522 Between 19.0°N, 159.9°W and 17.6°N, 160.8°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.099	1.004	.4938E-06	18.949	3.549	.1272E-03
13.249	1.002	.2358E-06	19.099	3.448	.1188E-03
13.399	.999	-.1014E-06	19.249	3.583	.1219E-03
13.549	1.001	.9132E-07	19.399	3.871	.1317E-03
13.699	.998	-.1930E-06	19.549	4.223	.1438E-03
13.849	.998	-.1754E-06	19.699	4.583	.1554E-03
13.999	1.003	.3657E-06	19.849	4.999	.1686E-03
14.149	1.009	.9700E-06	19.999	5.457	.1827E-03
14.299	1.027	.2893E-05	20.149	5.909	.1956E-03
14.449	1.075	.8018E-05	20.299	6.087	.1971E-03
14.599	1.120	.1243E-04	20.449	5.945	.1863E-03
14.749	1.117	.1185E-04	20.599	6.021	.1839E-03
14.899	1.092	.9105E-05	20.749	6.236	.1866E-03
15.049	1.085	.8200E-05	20.899	6.070	.1760E-03
15.199	1.106	.1002E-04	21.049	5.640	.1570E-03
15.349	1.138	.1276E-04	21.199	5.207	.1386E-03
15.499	1.165	.1494E-04	21.349	4.939	.1265E-03
15.649	1.180	.1592E-04	21.499	4.632	.1136E-03
15.799	1.189	.1632E-04	21.649	4.069	.9352E-04
15.949	1.183	.1541E-04	21.799	3.754	.8178E-04
16.099	1.167	.1380E-04	21.949	3.992	.8655E-04
16.249	1.175	.1410E-04	22.099	4.428	.9660E-04
16.399	1.205	.1610E-04	22.249	4.875	.1064E-03
16.549	1.234	.1798E-04	22.399	5.117	.1101E-03
16.699	1.254	.1900E-04	22.549	5.217	.1099E-03
16.849	1.262	.1912E-04	22.699	5.376	.1111E-03
16.999	1.285	.2025E-04	22.849	5.480	.1108E-03
17.149	1.393	.2714E-04	22.999	5.470	.1077E-03
17.299	1.843	.5667E-04	23.149	5.395	.1032E-03
17.449	2.633	.1069E-03	23.299	5.253	.9729E-04
17.599	3.111	.1345E-03	23.449	5.059	.9046E-04
17.749	3.226	.1381E-03	23.599	4.685	.8001E-04
17.899	3.357	.1423E-03	23.749	4.219	.6808E-04
18.049	3.360	.1387E-03	23.899	3.653	.5467E-04
18.199	3.337	.1337E-03	24.049	3.085	.4194E-04
18.349	3.319	.1292E-03	24.199	2.752	.3441E-04
18.499	3.285	.1240E-03	24.349	2.417	.2715E-04
18.649	3.434	.1285E-03	24.499	2.114	.2084E-04
18.799	3.621	.1346E-03	24.649	1.964	.1759E-04

Table A13. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.799	1.874	.1557E-04	30.649	1.707	.5071E-05
24.949	1.937	.1629E-04	30.799	1.699	.4904E-05
25.099	1.956	.1624E-04	30.949	1.620	.4252E-05
25.249	1.886	.1468E-04	31.099	1.469	.3143E-05
25.399	1.942	.1524E-04			
25.549	1.867	.1370E-04			
25.699	1.748	.1152E-04			
25.849	1.697	.1048E-04			
25.999	1.818	.1201E-04			
26.149	2.001	.1435E-04			
26.299	1.883	.1235E-04			
26.449	1.735	.1004E-04			
26.599	1.692	.9226E-05			
26.749	1.586	.7630E-05			
26.899	1.540	.6872E-05			
27.049	1.571	.7102E-05			
27.199	1.523	.6367E-05			
27.349	1.433	.5148E-05			
27.499	1.340	.3953E-05			
27.649	1.293	.3322E-05			
27.799	1.354	.3931E-05			
27.949	1.526	.5708E-05			
28.099	1.671	.7113E-05			
28.249	1.724	.7502E-05			
28.399	1.737	.7466E-05			
28.549	1.721	.7130E-05			
28.699	1.728	.7044E-05			
28.849	1.708	.6687E-05			
28.999	1.732	.6758E-05			
29.149	1.669	.6042E-05			
29.299	1.525	.4627E-05			
29.449	1.561	.4841E-05			
29.599	1.692	.5832E-05			
29.749	1.853	.7023E-05			
29.899	1.841	.6769E-05			
30.049	1.722	.5677E-05			
30.199	1.653	.5022E-05			
30.349	1.614	.4614E-05			
30.499	1.666	.4891E-05			

Table A14. Lidar Data Taken on May 12, 1983, at GMT 1536–1547 Between 16.2°N, 161.9°W and 15.0°N, 162.6°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.099	1.019	.2395E-05	18.949	3.905	.1450E-03
13.249	1.017	.2119E-05	19.099	3.883	.1399E-03
13.399	1.016	.1984E-05	19.249	3.761	.1303E-03
13.549	1.015	.1750E-05	19.399	3.666	.1223E-03
13.699	1.009	.1087E-05	19.549	3.871	.1280E-03
13.849	1.004	.4791E-06	19.699	4.193	.1384E-03
13.999	1.001	.1254E-06	19.849	4.439	.1450E-03
14.149	.996	-.4856E-06	19.999	4.751	.1537E-03
14.299	.991	-.9623E-06	20.149	5.221	.1682E-03
14.449	.997	-.3525E-06	20.299	5.640	.1798E-03
14.599	1.015	.1601E-05	20.449	6.009	.1887E-03
14.749	1.042	.4296E-05	20.599	6.456	.1998E-03
14.899	1.072	.7103E-05	20.749	6.861	.2089E-03
15.049	1.083	.8067E-05	20.899	7.032	.2094E-03
15.199	1.094	.8903E-05	21.049	6.998	.2029E-03
15.349	1.140	.1299E-04	21.199	6.746	.1894E-03
15.499	1.178	.1609E-04	21.349	6.464	.1754E-03
15.649	1.180	.1593E-04	21.499	6.060	.1583E-03
15.799	1.189	.1629E-04	21.649	5.489	.1368E-03
15.949	1.199	.1677E-04	21.799	4.941	.1170E-03
16.099	1.201	.1652E-04	21.949	4.391	.9809E-04
16.249	1.216	.1741E-04	22.099	4.351	.9443E-04
16.399	1.239	.1882E-04	22.249	4.526	.9683E-04
16.549	1.259	.1990E-04	22.399	4.107	.8312E-04
16.699	1.277	.2075E-04	22.549	3.540	.6619E-04
16.849	1.280	.2040E-04	22.699	3.468	.6267E-04
16.999	1.281	.1990E-04	22.849	3.491	.6161E-04
17.149	1.346	.2388E-04	22.999	3.765	.6664E-04
17.299	1.616	.4143E-04	23.149	4.568	.8378E-04
17.449	2.262	.8263E-04	23.299	4.983	.9110E-04
17.599	2.892	.1205E-03	23.449	5.009	.8934E-04
17.749	2.826	.1133E-03	23.599	4.952	.8580E-04
17.899	2.612	.9737E-04	23.749	4.779	.7993E-04
18.049	2.926	.1133E-03	23.899	4.723	.7672E-04
18.199	3.240	.1282E-03	24.049	4.736	.7514E-04
18.349	3.247	.1252E-03	24.199	4.809	.7478E-04
18.499	3.161	.1172E-03	24.349	4.942	.7554E-04
18.649	3.395	.1265E-03	24.499	4.920	.7333E-04
18.799	3.802	.1438E-03	24.649	4.597	.6568E-04

Table A14. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.799	4.100	.5525E-04	30.649	1.397	.2848E-05
24.949	3.669	.4643E-04	30.799	1.342	.2400E-05
25.099	3.258	.3833E-04	30.949	1.237	.1627E-05
25.249	2.798	.2979E-04	31.099	1.111	.7416E-06
25.399	2.435	.2321E-04			
25.549	2.180	.1863E-04			
25.699	2.123	.1731E-04			
25.849	2.209	.1819E-04			
25.999	2.025	.1505E-04			
26.149	1.858	.1230E-04			
26.299	2.033	.1446E-04			
26.449	1.985	.1345E-04			
26.599	1.703	.9379E-05			
26.749	1.653	.8511E-05			
26.899	1.744	.9471E-05			
27.049	1.748	.9305E-05			
27.199	1.713	.8678E-05			
27.349	1.734	.8720E-05			
27.499	1.755	.8771E-05			
27.649	1.657	.7457E-05			
27.799	1.630	.6990E-05			
27.949	1.729	.7902E-05			
28.099	1.723	.7665E-05			
28.249	1.681	.7049E-05			
28.399	1.631	.6390E-05			
28.549	1.587	.5810E-05			
28.699	1.572	.5527E-05			
28.849	1.535	.5055E-05			
28.999	1.538	.4969E-05			
29.149	1.488	.4407E-05			
29.299	1.341	.3009E-05			
29.449	1.240	.2068E-05			
29.599	1.352	.2963E-05			
29.749	1.557	.4583E-05			
29.899	1.617	.4963E-05			
30.049	1.480	.3779E-05			
30.199	1.320	.2458E-05			
30.349	1.332	.2497E-05			
30.499	1.442	.3243E-05			

Table A15. Lidar Data Taken on May 12, 1983, at GMT 1610–1623 Between 12.5°N, 164.2°W and 11.1°N, 165.1°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.099	1.023	.2941E-05	18.949	3.363	.1180E-03
13.249	1.025	.3065E-05	19.099	3.482	.1205E-03
13.399	1.019	.2318E-05	19.249	3.625	.1239E-03
13.549	1.010	.1169E-05	19.399	3.757	.1265E-03
13.699	1.003	.3633E-06	19.549	3.912	.1299E-03
13.849	1.007	.7877E-06	19.699	4.163	.1371E-03
13.999	1.005	.5938E-06	19.849	4.381	.1425E-03
14.149	.994	-.6192E-06	19.999	4.609	.1479E-03
14.299	.992	-.8193E-06	20.149	4.928	.1565E-03
14.449	.999	-.1431E-06	20.299	5.314	.1671E-03
14.599	1.009	.9562E-06	20.449	5.785	.1802E-03
14.749	1.024	.2446E-05	20.599	6.208	.1907E-03
14.899	1.046	.4603E-05	20.749	6.575	.1987E-03
15.049	1.072	.6962E-05	20.899	6.905	.2050E-03
15.199	1.086	.8118E-05	21.049	7.139	.2077E-03
15.349	1.103	.9529E-05	21.199	7.475	.2134E-03
15.499	1.163	.1470E-04	21.349	7.765	.2172E-03
15.649	1.252	.2231E-04	21.499	7.874	.2150E-03
15.799	1.316	.2729E-04	21.649	7.964	.2122E-03
15.949	1.338	.2852E-04	21.799	8.018	.2084E-03
16.099	1.350	.2885E-04	21.949	8.104	.2055E-03
16.249	1.352	.2834E-04	22.099	8.291	.2055E-03
16.399	1.335	.2632E-04	22.249	8.353	.2019E-03
16.549	1.329	.2531E-04	22.399	8.146	.1912E-03
16.699	1.329	.2462E-04	22.549	7.645	.1732E-03
16.849	1.311	.2269E-04	22.699	7.073	.1542E-03
16.999	1.293	.2079E-04	22.849	6.830	.1442E-03
17.149	1.339	.2342E-04	22.999	6.873	.1415E-03
17.299	1.469	.3152E-04	23.149	6.812	.1365E-03
17.449	1.617	.4040E-04	23.299	6.776	.1321E-03
17.599	1.780	.4971E-04	23.449	6.490	.1224E-03
17.749	1.964	.5982E-04	23.599	6.266	.1143E-03
17.899	2.218	.7356E-04	23.749	6.102	.1079E-03
18.049	2.553	.9132E-04	23.899	5.449	.9169E-04
18.199	2.717	.9827E-04	24.049	4.757	.7556E-04
18.349	2.703	.9491E-04	24.199	4.412	.6698E-04
18.499	2.806	.9796E-04	24.349	4.265	.6257E-04
18.649	2.974	.1042E-03	24.499	4.286	.6146E-04
18.799	3.182	.1120E-03	24.649	4.359	.6132E-04

Table A15. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.799	4.429	.6111E-04	30.649	1.712	.5110E-05
24.949	4.452	.6004E-04	30.799	1.679	.4761E-05
25.099	4.393	.5761E-04	30.949	1.637	.4365E-05
25.249	4.283	.5441E-04	31.099	1.531	.3554E-05
25.399	4.062	.4953E-04			
25.549	3.676	.4225E-04			
25.699	3.242	.3456E-04			
25.849	2.753	.2638E-04			
25.999	2.327	.1948E-04			
26.149	2.202	.1722E-04			
26.299	2.214	.1699E-04			
26.449	2.152	.1573E-04			
26.599	2.191	.1587E-04			
26.749	2.090	.1421E-04			
26.899	2.015	.1293E-04			
27.049	2.161	.1445E-04			
27.199	2.316	.1601E-04			
27.349	2.279	.1520E-04			
27.499	2.119	.1300E-04			
27.649	2.052	.1195E-04			
27.799	2.033	.1147E-04			
27.949	2.086	.1178E-04			
28.099	2.030	.1091E-04			
28.249	1.916	.9490E-05			
28.399	1.883	.8935E-05			
28.549	1.860	.8507E-05			
28.699	1.798	.7618E-05			
28.849	1.735	.6945E-05			
28.999	1.774	.7148E-05			
29.149	1.682	.6154E-05			
29.299	1.595	.5247E-05			
29.449	1.526	.4539E-05			
29.599	1.532	.4484E-05			
29.749	1.535	.4402E-05			
29.899	1.587	.4725E-05			
30.049	1.611	.4806E-05			
30.199	1.513	.3941E-05			
30.349	1.585	.4393E-05			
30.499	1.709	.5206E-05			

Table A16. Lidar Data Taken on May 12, 1983, at GMT 1637–1650 Between 9.5°N, 166.1°W and 8.0°N, 167.0°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.099	1.008	.9905E-06	18.949	2.965	.9810E-04
13.249	1.008	.1043E-05	19.099	3.318	.1125E-03
13.399	1.007	.8235E-06	19.249	3.815	.1328E-03
13.549	1.002	.2544E-06	19.399	4.319	.1523E-03
13.699	.998	-.1964E-06	19.549	4.553	.1585E-03
13.849	.994	-.6965E-06	19.699	4.704	.1606E-03
13.999	.990	-.1124E-05	19.849	4.990	.1682E-03
14.149	.998	-.2774E-06	19.999	5.215	.1728E-03
14.299	1.020	.2187E-05	20.149	5.288	.1709E-03
14.449	1.030	.3184E-05	20.299	5.515	.1749E-03
14.599	1.034	.3586E-05	20.449	5.925	.1855E-03
14.749	1.051	.5200E-05	20.599	6.276	.1932E-03
14.899	1.070	.6916E-05	20.749	6.528	.1970E-03
15.049	1.121	.1175E-04	20.899	6.854	.2033E-03
15.199	1.365	.3460E-04	21.049	7.256	.2116E-03
15.349	1.576	.5331E-04	21.199	7.636	.2187E-03
15.499	1.756	.6837E-04	21.349	7.938	.2228E-03
15.649	2.110	.9808E-04	21.499	8.145	.2235E-03
15.799	2.341	.1158E-03	21.649	8.220	.2200E-03
15.949	2.102	.9298E-04	21.799	8.331	.2177E-03
16.099	1.750	.6178E-04	21.949	8.397	.2140E-03
16.249	1.607	.4891E-04	22.099	8.384	.2081E-03
16.399	1.479	.3770E-04	22.249	8.279	.1999E-03
16.549	1.459	.3531E-04	22.399	8.144	.1911E-03
16.699	1.388	.2905E-04	22.549	8.178	.1871E-03
16.849	1.320	.2334E-04	22.699	8.094	.1801E-03
16.999	1.358	.2541E-04	22.849	8.027	.1738E-03
17.149	1.413	.2850E-04	22.999	7.954	.1676E-03
17.299	1.447	.3002E-04	23.149	7.851	.1609E-03
17.449	1.486	.3183E-04	23.299	7.644	.1520E-03
17.599	1.673	.4290E-04	23.449	7.117	.1363E-03
17.749	2.026	.6366E-04	23.599	6.510	.1196E-03
17.899	2.299	.7844E-04	23.749	5.887	.1034E-03
18.049	2.352	.7947E-04	23.899	5.225	.8707E-04
18.199	2.353	.7742E-04	24.049	5.013	.8071E-04
18.349	2.390	.7747E-04	24.199	4.982	.7818E-04
18.499	2.436	.7791E-04	24.349	4.883	.7440E-04
18.649	2.555	.8214E-04	24.499	4.899	.7293E-04
18.799	2.765	.9064E-04	24.649	4.953	.7218E-04

Table A16. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.799	4.877	.6910E-04	30.649	1.759	.5446E-05
24.949	4.765	.6549E-04	30.799	1.577	.4046E-05
25.099	4.595	.6104E-04	30.949	1.528	.3615E-05
25.249	4.281	.5437E-04	31.099	1.544	.3646E-05
25.399	3.832	.4580E-04			
25.549	3.527	.3991E-04			
25.699	3.294	.3536E-04			
25.849	3.049	.3082E-04			
25.999	2.771	.2601E-04			
26.149	2.584	.2271E-04			
26.299	2.466	.2051E-04			
26.449	2.419	.1937E-04			
26.599	2.485	.1981E-04			
26.749	2.480	.1929E-04			
26.899	2.462	.1862E-04			
27.049	2.464	.1822E-04			
27.199	2.456	.1771E-04			
27.349	2.428	.1698E-04			
27.499	2.330	.1546E-04			
27.649	2.217	.1382E-04			
27.799	2.170	.1298E-04			
27.949	2.172	.1271E-04			
28.099	2.085	.1150E-04			
28.249	2.049	.1087E-04			
28.399	2.020	.1032E-04			
28.549	2.093	.1082E-04			
28.699	2.059	.1024E-04			
28.849	1.926	.8749E-05			
28.999	1.870	.8033E-05			
29.149	1.778	.7020E-05			
29.299	1.603	.5322E-05			
29.449	1.663	.5717E-05			
29.599	1.911	.7672E-05			
29.749	1.949	.7816E-05			
29.899	1.889	.7158E-05			
30.049	1.877	.6900E-05			
30.199	1.781	.6005E-05			
30.349	1.756	.5678E-05			
30.499	1.801	.5881E-05			

Table A17. Lidar Data Taken on May 12, 1983, at GMT 1752–1812 Between 1.1°N, 171.0°W and 1.3°S, 170.2°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
14.440	1.491	.5251E-04	20.290	5.590	.1806E-03
14.590	1.493	.5154E-04	20.440	5.871	.1863E-03
14.740	1.368	.3767E-04	20.590	6.064	.1883E-03
14.890	1.186	.1860E-04	20.740	5.924	.1781E-03
15.040	1.052	.5091E-05	20.890	5.457	.1570E-03
15.190	.985	-.1445E-05	21.040	5.591	.1575E-03
15.340	.984	-.1451E-05	21.190	6.315	.1775E-03
15.490	.986	-.1309E-05	21.340	6.981	.1946E-03
15.640	.993	-.6369E-06	21.490	7.214	.1969E-03
15.790	.997	-.2992E-06	21.640	7.202	.1914E-03
15.940	1.015	.1325E-05	21.790	7.230	.1872E-03
16.090	1.040	.3390E-05	21.940	7.152	.1800E-03
16.240	1.062	.5053E-05	22.090	6.947	.1695E-03
16.390	1.079	.6316E-05	22.240	6.767	.1600E-03
16.540	1.088	.6902E-05	22.390	6.582	.1509E-03
16.690	1.107	.8177E-05	22.540	6.375	.1415E-03
16.840	1.127	.9475E-05	22.690	6.384	.1380E-03
16.990	1.143	.1033E-04	22.840	6.464	.1364E-03
17.140	1.175	.1235E-04	22.990	6.577	.1356E-03
17.290	1.220	.1507E-04	23.140	6.678	.1344E-03
17.440	1.247	.1648E-04	23.290	6.547	.1279E-03
17.590	1.279	.1810E-04	23.440	6.397	.1212E-03
17.740	1.327	.2069E-04	23.590	6.308	.1161E-03
17.890	1.384	.2361E-04	23.740	6.033	.1072E-03
18.040	1.488	.2923E-04	23.890	5.659	.9662E-04
18.190	1.653	.3803E-04	24.040	5.512	.9132E-04
18.340	1.858	.4865E-04	24.190	5.403	.8696E-04
18.490	2.162	.6411E-04	24.340	5.118	.7937E-04
18.640	2.628	.8741E-04	24.490	4.796	.7141E-04
18.790	3.056	.1073E-03	24.640	4.341	.6133E-04
18.940	3.309	.1172E-03	24.790	3.871	.5144E-04
19.090	3.524	.1245E-03	24.940	3.419	.4229E-04
19.240	3.803	.1344E-03	25.090	3.211	.3773E-04
19.390	4.093	.1442E-03	25.240	3.149	.3578E-04
19.540	4.321	.1505E-03	25.390	3.105	.3421E-04
19.690	4.559	.1568E-03	25.540	3.005	.3180E-04
19.840	4.885	.1664E-03	25.690	2.991	.3082E-04
19.990	5.179	.1740E-03	25.840	2.997	.3016E-04
20.140	5.376	.1771E-03	25.990	2.919	.2829E-04

Table A17. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
26.140	2.986	.2857E-04			
26.290	3.045	.2871E-04			
26.440	2.969	.2698E-04			
26.590	2.726	.2309E-04			
26.740	2.468	.1919E-04			
26.890	2.357	.1735E-04			
27.040	2.234	.1542E-04			
27.190	2.189	.1453E-04			
27.340	2.356	.1619E-04			
27.490	2.275	.1488E-04			
27.640	1.970	.1106E-04			
27.790	1.874	.9747E-05			
27.940	1.935	.1019E-04			
28.090	1.915	.9751E-05			
28.240	1.866	.9017E-05			
28.390	1.888	.9037E-05			
28.540	2.111	.1105E-04			
28.690	2.113	.1083E-04			
28.840	1.674	.6409E-05			
28.990	1.375	.3482E-05			
29.140	1.451	.4097E-05			
29.290	1.399	.3545E-05			
29.440	1.223	.1939E-05			
29.590	1.362	.3069E-05			
29.740	1.671	.5563E-05			
29.890	1.709	.5751E-05			
30.040	1.484	.3835E-05			
30.190	1.135	.1047E-05			
30.340	.951	-.3732E-06			
30.490	1.234	.1731E-05			
30.640	1.664	.4803E-05			
30.790	1.687	.4857E-05			
30.940	1.502	.3472E-05			
31.090	1.367	.2478E-05			
31.240	1.326	.2152E-05			

Table A18. Lidar Data Taken on May 12, 1983, at GMT 1934–1946 Between 11.1°S, 168.9°W and 12.4°S, 169.7°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
15.111	.948	-.5049E-05	20.961	3.847	.9905E-04
15.261	.946	-.5091E-05	21.111	3.857	.9678E-04
15.411	.968	-.2980E-05	21.261	3.775	.9155E-04
15.561	1.002	.1403E-06	21.411	3.723	.8749E-04
15.711	1.006	.5596E-06	21.561	3.767	.8657E-04
15.861	.986	-.1195E-05	21.711	3.725	.8304E-04
16.011	.993	-.5851E-06	21.861	3.673	.7933E-04
16.161	1.013	.1064E-05	22.011	3.725	.7874E-04
16.311	1.020	.1636E-05	22.161	3.685	.7557E-04
16.461	1.029	.2274E-05	22.311	3.496	.6841E-04
16.611	1.045	.3473E-05	22.461	3.259	.6029E-04
16.761	1.064	.4855E-05	22.611	3.015	.5239E-04
16.911	1.076	.5585E-05	22.761	2.932	.4890E-04
17.061	1.087	.6202E-05	22.911	2.819	.4485E-04
17.211	1.095	.6581E-05	23.061	2.522	.3654E-04
17.361	1.111	.7503E-05	23.211	2.368	.3198E-04
17.511	1.181	.1190E-04	23.361	2.437	.3273E-04
17.661	1.325	.2081E-04	23.511	2.518	.3365E-04
17.811	1.439	.2737E-04	23.661	2.388	.2997E-04
17.961	1.488	.2965E-04	23.811	2.196	.2515E-04
18.111	1.561	.3314E-04	23.961	2.164	.2387E-04
18.261	1.648	.3723E-04	24.111	2.250	.2500E-04
18.411	1.753	.4215E-04	24.261	2.231	.2403E-04
18.561	1.918	.5000E-04	24.411	2.138	.2168E-04
18.711	2.079	.5718E-04	24.561	2.092	.2030E-04
18.861	2.195	.6157E-04	24.711	2.047	.1900E-04
19.011	2.354	.6780E-04	24.861	2.016	.1799E-04
19.161	2.511	.7357E-04	25.011	2.015	.1755E-04
19.311	2.711	.8096E-04	25.161	2.254	.2115E-04
19.461	2.925	.8855E-04	25.311	2.477	.2432E-04
19.611	3.038	.9114E-04	25.461	2.588	.2552E-04
19.761	3.156	.9374E-04	25.611	2.576	.2470E-04
19.911	3.254	.9526E-04	25.761	2.392	.2130E-04
20.061	3.336	.9598E-04	25.911	2.152	.1721E-04
20.211	3.461	.9827E-04	26.061	1.912	.1330E-04
20.361	3.560	.9939E-04	26.211	1.710	.1010E-04
20.511	3.571	.9703E-04	26.361	1.650	.9025E-05
20.661	3.638	.9679E-04	26.511	1.718	.9720E-05
20.811	3.785	.9949E-04	26.661	1.761	.1008E-04

Table A18. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
26.811	1.839	.1085E-04			
26.961	1.783	.9906E-05			
27.111	1.562	.6953E-05			
27.261	1.438	.5295E-05			
27.411	1.490	.5782E-05			
27.561	1.570	.6578E-05			
27.711	1.611	.6895E-05			
27.861	1.794	.8757E-05			
28.011	1.918	.9905E-05			
28.161	1.712	.7510E-05			
28.311	1.672	.6929E-05			
28.461	1.679	.6844E-05			
28.611	1.507	.4995E-05			
28.761	1.376	.3616E-05			
28.911	1.347	.3265E-05			
29.061	1.317	.2915E-05			
29.211	1.397	.3568E-05			
29.361	1.571	.5020E-05			
29.511	1.662	.5687E-05			
29.661	1.719	.6036E-05			
29.811	1.519	.4257E-05			
29.961	1.443	.3553E-05			
30.111	1.520	.4081E-05			
30.261	1.533	.4089E-05			
30.411	1.590	.4419E-05			
30.561	1.574	.4207E-05			
30.711	1.406	.2906E-05			
30.861	1.218	.1522E-05			
31.011	1.197	.1349E-05			
31.161	1.472	.3156E-05			

Table A19. Lidar Data Taken on May 14, 1983, at GMT 0549–0556 Between 16.9°S, 171.1°W and 17.7°S, 172.0°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.130	1.088	.1118E-04	18.980	2.588	.7991E-04
13.280	1.074	.9257E-05	19.130	2.658	.8097E-04
13.430	1.064	.7860E-05	19.280	2.639	.7773E-04
13.580	1.053	.6365E-05	19.430	2.667	.7673E-04
13.730	1.042	.4932E-05	19.580	3.081	.9300E-04
13.880	1.028	.3250E-05	19.730	3.556	.1109E-03
14.030	1.014	.1633E-05	19.880	3.661	.1121E-03
14.180	1.005	.6176E-06	20.030	3.629	.1075E-03
14.330	1.000	-.4077E-07	20.180	3.608	.1035E-03
14.480	.994	-.6167E-06	20.330	3.727	.1051E-03
14.630	.998	-.1643E-06	20.480	3.906	.1087E-03
14.780	1.002	.2234E-06	20.630	4.072	.1115E-03
14.930	1.003	.2715E-06	20.780	4.159	.1116E-03
15.080	1.006	.6100E-06	20.930	4.179	.1095E-03
15.230	1.003	.2570E-06	21.080	4.139	.1055E-03
15.380	1.007	.6448E-06	21.230	4.053	.1000E-03
15.530	1.039	.3537E-05	21.380	3.936	.9382E-04
15.680	1.128	.1139E-04	21.530	3.815	.8770E-04
15.830	1.222	.1935E-04	21.680	3.794	.8490E-04
15.980	1.219	.1860E-04	21.830	3.791	.8270E-04
16.130	1.155	.1289E-04	21.980	3.724	.7872E-04
16.280	1.126	.1020E-04	22.130	3.558	.7208E-04
16.430	1.116	.9237E-05	22.280	3.061	.5663E-04
16.580	1.141	.1090E-04	22.430	2.525	.4087E-04
16.730	1.168	.1270E-04	22.580	2.071	.2799E-04
16.880	1.206	.1518E-04	22.730	1.720	.1835E-04
17.030	1.259	.1856E-04	22.880	1.718	.1784E-04
17.180	1.315	.2194E-04	23.030	1.733	.1777E-04
17.330	1.393	.2668E-04	23.180	1.760	.1797E-04
17.480	1.493	.3261E-04	23.330	1.769	.1772E-04
17.630	1.610	.3926E-04	23.480	1.670	.1505E-04
17.780	1.768	.4810E-04	23.630	1.511	.1119E-04
17.930	1.894	.5457E-04	23.780	1.343	.7336E-05
18.080	1.939	.5576E-04	23.930	1.262	.5464E-05
18.230	1.960	.5555E-04	24.080	1.239	.4852E-05
18.380	2.031	.5805E-04	24.230	1.206	.4085E-05
18.530	2.183	.6488E-04	24.380	1.204	.3948E-05
18.680	2.326	.7081E-04	24.530	1.236	.4438E-05
18.830	2.412	.7318E-04	24.680	1.296	.5438E-05

Table A19. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.830	1.228	.4084E-05	30.680	1.216	.1553E-05
24.980	1.131	.2289E-05	30.830	1.230	.1620E-05
25.130	1.125	.2126E-05	30.980	1.161	.1108E-05
25.280	1.133	.2214E-05	31.130	1.138	.9280E-06
25.430	1.145	.2353E-05	31.280	1.047	.3071E-06
25.580	1.198	.3117E-05	31.430	1.074	.4757E-06
25.730	1.309	.4751E-05	31.580	1.213	.1329E-05
25.880	1.434	.6509E-05	31.730	1.081	.4929E-06
26.030	1.529	.7732E-05	31.880	.915	-.5031E-06
26.180	1.593	.8447E-05	32.030	.883	-.6808E-06
26.330	1.593	.8246E-05	32.180	.934	-.3728E-06
26.480	1.473	.6414E-05	32.330	1.059	.3251E-06
26.630	1.415	.5491E-05	32.480	1.124	.6679E-06
26.780	1.416	.5385E-05	32.630	1.121	.6328E-06
26.930	1.418	.5283E-05	32.780	1.101	.5194E-06
27.080	1.421	.5205E-05	32.930	1.051	.2548E-06
27.230	1.421	.5083E-05	33.080	1.022	.1061E-06
27.380	1.455	.5379E-05	33.230	1.046	.2190E-06
27.530	1.417	.4815E-05	33.380	1.095	.4386E-06
27.680	1.318	.3587E-05	33.530	1.095	.4279E-06
27.830	1.261	.2879E-05			
27.980	1.344	.3710E-05			
28.130	1.297	.3138E-05			
28.280	1.209	.2156E-05			
28.430	1.228	.2303E-05			
28.580	1.215	.2119E-05			
28.730	1.174	.1677E-05			
28.880	1.201	.1899E-05			
29.030	1.272	.2508E-05			
29.180	1.213	.1921E-05			
29.330	1.148	.1305E-05			
29.480	1.138	.1185E-05			
29.630	1.161	.1359E-05			
29.780	1.160	.1313E-05			
29.930	1.179	.1441E-05			
30.080	1.267	.2099E-05			
30.230	1.245	.1882E-05			
30.380	1.094	.7069E-06			
30.530	1.094	.6883E-06			

Table A20. Lidar Data Taken on May 14, 1983, at GMT 0641–0649 Between 23.0°S, 174.2°W and 23.8°S, 174.5°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.526	1.058	.7105E-05	19.376	2.340	.6233E-04
13.676	1.061	.7243E-05	19.526	2.476	.6665E-04
13.826	1.063	.7375E-05	19.676	2.627	.7131E-04
13.976	1.068	.7873E-05	19.826	2.590	.6768E-04
14.126	1.074	.8341E-05	19.976	2.631	.6740E-04
14.276	1.081	.8967E-05	20.126	2.709	.6856E-04
14.426	1.110	.1198E-04	20.276	2.886	.7341E-04
14.576	1.167	.1772E-04	20.426	3.205	.8334E-04
14.726	1.237	.2456E-04	20.576	3.322	.8519E-04
14.876	1.292	.2948E-04	20.726	3.264	.8071E-04
15.026	1.340	.3359E-04	20.876	3.260	.7858E-04
15.176	1.410	.3958E-04	21.026	3.269	.7694E-04
15.326	1.462	.4356E-04	21.176	3.255	.7457E-04
15.476	1.470	.4327E-04	21.326	3.328	.7505E-04
15.626	1.443	.3987E-04	21.476	3.466	.7753E-04
15.776	1.468	.4111E-04	21.626	3.533	.7768E-04
15.926	1.508	.4361E-04	21.776	3.570	.7685E-04
16.076	1.430	.3609E-04	21.926	3.575	.7509E-04
16.226	1.373	.3053E-04	22.076	3.575	.7322E-04
16.376	1.422	.3374E-04	22.226	3.551	.7075E-04
16.526	1.453	.3540E-04	22.376	3.363	.6390E-04
16.676	1.482	.3678E-04	22.526	2.996	.5264E-04
16.826	1.659	.4894E-04	22.676	2.594	.4100E-04
16.976	1.841	.6077E-04	22.826	2.255	.3147E-04
17.126	1.895	.6299E-04	22.976	1.948	.2319E-04
17.276	1.969	.6638E-04	23.126	1.701	.1672E-04
17.426	1.997	.6656E-04	23.276	1.481	.1118E-04
17.576	1.972	.6316E-04	23.426	1.321	.7279E-05
17.726	1.969	.6133E-04	23.576	1.312	.6904E-05
17.876	2.024	.6307E-04	23.726	1.348	.7496E-05
18.026	2.081	.6484E-04	23.876	1.280	.5882E-05
18.176	2.157	.6757E-04	24.026	1.168	.3453E-05
18.326	2.272	.7232E-04	24.176	1.112	.2238E-05
18.476	2.351	.7479E-04	24.326	1.111	.2163E-05
18.626	2.332	.7179E-04	24.476	1.097	.1839E-05
18.776	2.292	.6770E-04	24.626	1.074	.1366E-05
18.926	2.265	.6432E-04	24.776	1.088	.1592E-05
19.076	2.260	.6221E-04	24.926	1.087	.1538E-05
19.226	2.315	.6301E-04	25.076	1.069	.1183E-05

Table A20. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
25.226	1.046	.7767E-06	31.076	1.098	.6620E-06
25.376	1.032	.5230E-06	31.226	1.028	.1853E-06
25.526	1.005	.7985E-07	31.376	1.121	.7796E-06
25.676	1.000	-.3481E-08	31.526	1.126	.7907E-06
25.826	.987	-.2042E-06	31.676	1.172	.1055E-05
25.976	.963	-.5394E-06	31.826	1.297	.1780E-05
26.126	.992	-.1195E-06	31.976	1.249	.1454E-05
26.276	1.013	.1786E-06	32.126	1.098	.5606E-06
26.426	1.013	.1836E-06	32.276	1.041	.2305E-06
26.576	.975	-.3321E-06	32.426	1.090	.4877E-06
26.726	.981	-.2471E-06	32.576	1.104	.5502E-06
26.876	.979	-.2739E-06	32.726	1.083	.4289E-06
27.026	.961	-.4839E-06	32.876	1.074	.3745E-06
27.176	1.010	.1255E-06	33.026	1.118	.5810E-06
27.326	1.069	.8215E-06	33.176	1.140	.6723E-06
27.476	1.040	.4661E-06	33.326	1.045	.2093E-06
27.626	1.044	.5004E-06	33.476	.999	-.2730E-08
27.776	1.088	.9786E-06			
27.926	1.062	.6731E-06			
28.076	.996	-.3837E-07			
28.226	.941	-.6111E-06			
28.376	.945	-.5587E-06			
28.526	.960	-.4008E-06			
28.676	.943	-.5513E-06			
28.826	.957	-.4091E-06			
28.976	.907	-.8602E-06			
29.126	.850	-.1360E-05			
29.276	.922	-.6897E-06			
29.426	.971	-.2537E-06			
29.576	.980	-.1664E-06			
29.726	1.087	.7260E-06			
29.876	1.071	.5773E-06			
30.026	1.008	.6417E-07			
30.176	1.074	.5770E-06			
30.326	1.127	.9646E-06			
30.476	1.089	.6596E-06			
30.626	1.042	.3014E-06			
30.776	1.118	.8390E-06			
30.926	1.162	.1123E-05			

Table A21. Lidar Data Taken on May 14, 1983, at GMT 0736–0750 Between 28.6°S, 176.7°W and 30.0°S, 177.3°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.221	1.290	.3390E-04	19.071	2.595	.7121E-04
13.371	1.305	.3465E-04	19.221	2.886	.8214E-04
13.521	1.361	.3998E-04	19.371	2.993	.8468E-04
13.671	1.455	.4906E-04	19.521	2.901	.7878E-04
13.821	1.552	.5812E-04	19.671	2.555	.6286E-04
13.971	1.619	.6368E-04	19.821	2.076	.4244E-04
14.121	1.666	.6685E-04	19.971	1.779	.2996E-04
14.271	1.703	.6900E-04	20.121	1.675	.2531E-04
14.421	1.755	.7231E-04	20.271	1.693	.2535E-04
14.571	1.819	.7662E-04	20.421	1.829	.2962E-04
14.721	1.847	.7732E-04	20.571	1.938	.3267E-04
14.871	1.829	.7388E-04	20.721	1.935	.3179E-04
15.021	1.805	.7010E-04	20.871	1.865	.2871E-04
15.171	1.791	.6725E-04	21.021	1.752	.2436E-04
15.321	1.814	.6757E-04	21.171	1.676	.2138E-04
15.471	1.931	.7549E-04	21.321	1.662	.2042E-04
15.621	2.088	.8617E-04	21.471	1.630	.1898E-04
15.771	2.164	.9000E-04	21.621	1.584	.1716E-04
15.921	2.172	.8847E-04	21.771	1.534	.1532E-04
16.071	2.184	.8726E-04	21.921	1.453	.1267E-04
16.221	2.210	.8704E-04	22.071	1.387	.1058E-04
16.371	2.234	.8655E-04	22.221	1.391	.1043E-04
16.521	2.255	.8587E-04	22.371	1.397	.1034E-04
16.671	2.285	.8571E-04	22.521	1.346	.8789E-05
16.821	2.355	.8814E-04	22.671	1.324	.8035E-05
16.971	2.459	.9253E-04	22.821	1.361	.8742E-05
17.121	2.504	.9300E-04	22.971	1.465	.1098E-04
17.271	2.491	.8991E-04	23.121	1.494	.1138E-04
17.421	2.511	.8885E-04	23.271	1.450	.1012E-04
17.571	2.588	.9105E-04	23.421	1.512	.1124E-04
17.721	2.659	.9275E-04	23.571	1.596	.1278E-04
17.871	2.649	.8990E-04	23.721	1.666	.1393E-04
18.021	2.546	.8222E-04	23.871	1.714	.1459E-04
18.171	2.357	.7038E-04	24.021	1.685	.1368E-04
18.321	2.162	.5874E-04	24.171	1.601	.1172E-04
18.471	2.031	.5084E-04	24.321	1.508	.9677E-05
18.621	1.973	.4678E-04	24.471	1.403	.7491E-05
18.771	1.965	.4530E-04	24.621	1.332	.6025E-05
18.921	2.199	.5486E-04	24.771	1.317	.5634E-05

Table A21. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.921	1.352	.6107E-05	30.771	1.076	.5279E-06
25.071	1.329	.5578E-05	30.921	1.044	.3005E-06
25.221	1.265	.4388E-05			
25.371	1.197	.3181E-05			
25.521	1.199	.3140E-05			
25.671	1.305	.4706E-05			
25.821	1.358	.5388E-05			
25.971	1.313	.4611E-05			
26.121	1.236	.3389E-05			
26.271	1.208	.2920E-05			
26.421	1.243	.3332E-05			
26.571	1.260	.3478E-05			
26.721	1.223	.2915E-05			
26.871	1.165	.2102E-05			
27.021	1.080	.9942E-06			
27.171	1.028	.3455E-06			
27.321	1.016	.1858E-06			
27.471	1.009	.1044E-06			
27.621	.982	-.1999E-06			
27.771	.991	-.1052E-06			
27.921	1.002	.2696E-07			
28.071	.963	-.3900E-06			
28.221	.956	-.4531E-06			
28.371	1.011	.1094E-06			
28.521	1.021	.2045E-06			
28.671	1.024	.2319E-06			
28.821	1.052	.4852E-06			
28.971	1.027	.2523E-06			
29.121	1.009	.7669E-07			
29.271	1.019	.1638E-06			
29.421	1.001	.6186E-08			
29.571	1.006	.5013E-07			
29.721	1.079	.6438E-06			
29.871	1.025	.1970E-06			
30.021	.980	-.1534E-06			
30.171	1.065	.4929E-06			
30.321	1.099	.7388E-06			
30.471	1.075	.5466E-06			
30.621	1.039	.2759E-06			

Table A22. Lidar Data Taken on May 14, 1983, at GMT 0831-0844 Between 34.0°S, 179.4°W and 35.3°S, 179.9°E

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.221	1.369	.4304E-04	19.071	1.391	.1746E-04
13.371	1.381	.4337E-04	19.221	1.396	.1726E-04
13.521	1.419	.4639E-04	19.371	1.410	.1742E-04
13.671	1.486	.5241E-04	19.521	1.416	.1725E-04
13.821	1.552	.5820E-04	19.671	1.406	.1643E-04
13.971	1.605	.6226E-04	19.821	1.512	.2019E-04
14.121	1.652	.6551E-04	19.971	1.930	.3578E-04
14.271	1.690	.6772E-04	20.121	2.421	.5332E-04
14.421	1.721	.6902E-04	20.271	2.538	.5629E-04
14.571	1.746	.6981E-04	20.421	2.194	.4264E-04
14.721	1.770	.7033E-04	20.571	1.704	.2454E-04
14.871	1.790	.7045E-04	20.721	1.510	.1736E-04
15.021	1.802	.6987E-04	20.871	1.498	.1653E-04
15.171	1.840	.7143E-04	21.021	1.525	.1699E-04
15.321	1.976	.8106E-04	21.171	1.646	.2042E-04
15.471	2.133	.9185E-04	21.321	1.790	.2438E-04
15.621	2.193	.9446E-04	21.471	1.910	.2740E-04
15.771	2.185	.9162E-04	21.621	1.958	.2816E-04
15.921	2.184	.8939E-04	21.771	1.890	.2555E-04
16.071	2.208	.8906E-04	21.921	1.813	.2276E-04
16.221	2.214	.8736E-04	22.071	1.741	.2026E-04
16.371	2.213	.8512E-04	22.221	1.676	.1802E-04
16.521	2.233	.8434E-04	22.371	1.637	.1660E-04
16.671	2.291	.8614E-04	22.521	1.518	.1316E-04
16.821	2.361	.8851E-04	22.671	1.382	.9478E-05
16.971	2.409	.8938E-04	22.821	1.312	.7559E-05
17.121	2.428	.8835E-04	22.971	1.316	.7473E-05
17.271	2.437	.8667E-04	23.121	1.292	.6736E-05
17.421	2.449	.8523E-04	23.271	1.239	.5389E-05
17.571	2.410	.8083E-04	23.421	1.190	.4176E-05
17.721	2.325	.7407E-04	23.571	1.168	.3597E-05
17.871	2.237	.6747E-04	23.721	1.140	.2934E-05
18.021	2.145	.6086E-04	23.871	1.078	.1592E-05
18.171	2.053	.5458E-04	24.021	1.031	.6246E-06
18.321	1.935	.4725E-04	24.171	1.031	.6034E-06
18.471	1.714	.3519E-04	24.321	1.031	.5834E-06
18.621	1.506	.2433E-04	24.471	.992	-.1533E-06
18.771	1.421	.1976E-04	24.621	1.003	.5888E-07
18.921	1.415	.1898E-04	24.771	1.059	.1042E-05

Table A22. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.921	1.062	.1071E-05	30.771	1.090	.6254E-06
25.071	1.036	.6129E-06	30.921	1.107	.7242E-06
25.221	1.018	.2942E-06			
25.371	1.004	.6792E-07			
25.521	.986	-.2212E-06			
25.671	1.001	.1681E-07			
25.821	1.027	.4056E-06			
25.971	1.012	.1834E-06			
26.121	.973	-.3936E-06			
26.271	.958	-.5929E-06			
26.421	1.011	.1462E-06			
26.571	1.047	.6228E-06			
26.721	1.019	.2458E-06			
26.871	.985	-.1865E-06			
27.021	.988	-.1501E-06			
27.171	.982	-.2196E-06			
27.321	.985	-.1797E-06			
27.471	.988	-.1440E-06			
27.621	.975	-.2878E-06			
27.771	1.003	.3796E-07			
27.921	1.008	.8422E-07			
28.071	1.003	.2747E-07			
28.221	1.006	.5787E-07			
28.371	1.037	.3708E-06			
28.521	1.032	.3156E-06			
28.671	.970	-.2898E-06			
28.821	1.004	.3403E-07			
28.971	1.019	.1791E-06			
29.121	.976	-.2138E-06			
29.271	.976	-.2106E-06			
29.421	1.061	.5229E-06			
29.571	1.039	.3286E-06			
29.721	1.042	.3395E-06			
29.871	1.090	.7216E-06			
30.021	1.077	.6015E-06			
30.171	1.116	.8862E-06			
30.321	1.118	.8786E-06			
30.471	1.041	.3017E-06			
30.621	1.036	.2529E-06			

Table A23. Lidar Data Taken on May 14, 1983, at GMT 0920–0933 Between 38.8°S, 177.8°E and 39.8°S, 176.5°E

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.221	1.415	.4840E-04	19.071	2.029	.4594E-04
13.371	1.435	.4942E-04	19.221	1.911	.3967E-04
13.521	1.469	.5196E-04	19.371	1.805	.3419E-04
13.671	1.568	.6128E-04	19.521	1.708	.2933E-04
13.821	1.687	.7234E-04	19.671	1.658	.2662E-04
13.971	1.729	.7497E-04	19.821	1.679	.2679E-04
14.121	1.738	.7416E-04	19.971	1.736	.2832E-04
14.271	1.750	.7356E-04	20.121	1.750	.2815E-04
14.421	1.727	.6963E-04	20.271	1.719	.2631E-04
14.571	1.694	.6488E-04	20.421	1.666	.2377E-04
14.721	1.725	.6624E-04	20.571	1.614	.2140E-04
14.871	1.787	.7014E-04	20.721	1.595	.2023E-04
15.021	1.825	.7187E-04	20.871	1.543	.1801E-04
15.171	1.851	.7240E-04	21.021	1.444	.1440E-04
15.321	1.859	.7135E-04	21.171	1.363	.1148E-04
15.471	1.865	.7016E-04	21.321	1.294	.9079E-05
15.621	1.921	.7291E-04	21.471	1.253	.7617E-05
15.771	2.033	.7988E-04	21.621	1.211	.6196E-05
15.921	2.085	.8186E-04	21.771	1.168	.4823E-05
16.071	2.048	.7722E-04	21.921	1.143	.4004E-05
16.221	2.022	.7352E-04	22.071	1.118	.3237E-05
16.371	2.040	.7292E-04	22.221	1.117	.3128E-05
16.521	2.089	.7450E-04	22.371	1.119	.3089E-05
16.671	2.135	.7568E-04	22.521	1.116	.2957E-05
16.821	2.167	.7591E-04	22.671	1.116	.2866E-05
16.971	2.212	.7689E-04	22.821	1.096	.2332E-05
17.121	2.277	.7896E-04	22.971	1.069	.1640E-05
17.271	2.299	.7836E-04	23.121	1.039	.9108E-06
17.421	2.259	.7406E-04	23.271	1.029	.6502E-06
17.571	2.198	.6869E-04	23.421	1.031	.6889E-06
17.721	2.124	.6287E-04	23.571	1.028	.5913E-06
17.871	2.072	.5847E-04	23.721	1.034	.7201E-06
18.021	2.023	.5440E-04	23.871	1.020	.4128E-06
18.171	1.973	.5043E-04	24.021	1.029	.5764E-06
18.321	1.989	.5000E-04	24.171	1.025	.4873E-06
18.471	2.060	.5225E-04	24.321	.967	-.6361E-06
18.621	2.100	.5289E-04	24.471	.979	-.3889E-06
18.771	2.114	.5228E-04	24.621	1.000	.7947E-08
18.921	2.112	.5089E-04	24.771	.986	-.2530E-06

Table A23. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.921	.995	-.8708E-07	30.771	1.200	.1387E-05
25.071	1.018	.3104E-06	30.921	1.219	.1482E-05
25.221	1.020	.3315E-06			
25.371	.994	-.9468E-07			
25.521	.979	-.3327E-06			
25.671	1.004	.6669E-07			
25.821	1.048	.7236E-06			
25.971	1.050	.7361E-06			
26.121	1.013	.1882E-06			
26.271	.984	-.2263E-06			
26.421	1.001	.1002E-07			
26.571	1.009	.1202E-06			
26.721	1.007	.9234E-07			
26.871	1.033	.4233E-06			
27.021	1.049	.6142E-06			
27.171	1.057	.6903E-06			
27.321	1.063	.7477E-06			
27.471	1.066	.7647E-06			
27.621	1.067	.7574E-06			
27.771	1.102	.1128E-05			
27.921	1.109	.1181E-05			
28.071	1.099	.1044E-05			
28.221	1.101	.1046E-05			
28.371	1.064	.6504E-06			
28.521	1.052	.5103E-06			
28.671	1.061	.5925E-06			
28.821	1.060	.5680E-06			
28.971	1.111	.1022E-05			
29.121	1.150	.1344E-05			
29.271	1.098	.8556E-06			
29.421	1.100	.8553E-06			
29.571	1.138	.1155E-05			
29.721	1.150	.1229E-05			
29.871	1.130	.1034E-05			
30.021	1.158	.1232E-05			
30.171	1.192	.1462E-05			
30.321	1.181	.1349E-05			
30.471	1.200	.1454E-05			
30.621	1.236	.1675E-05			

Table A24. Lidar Data Taken on May 17, 1983, at GMT 0056–0116 Between 45.6°S, 170.6°E and 47.9°S, 168.0°E

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
11.058	1.051	.7559E-05	16.908	3.004	.1208E-03
11.208	1.428	.6232E-04	17.058	2.998	.1178E-03
11.358	1.747	.1060E-03	17.208	2.995	.1149E-03
11.508	1.962	.1330E-03	17.358	2.986	.1119E-03
11.658	2.099	.1483E-03	17.508	3.052	.1130E-03
11.808	2.180	.1556E-03	17.658	3.101	.1131E-03
11.958	2.232	.1588E-03	17.808	3.078	.1094E-03
12.108	2.347	.1698E-03	17.958	3.014	.1036E-03
12.258	2.440	.1774E-03	18.108	2.992	.1002E-03
12.408	2.392	.1676E-03	18.258	2.949	.9584E-04
12.558	2.303	.1534E-03	18.408	2.806	.8681E-04
12.708	2.260	.1450E-03	18.558	2.693	.7948E-04
12.858	2.249	.1405E-03	18.708	2.697	.7787E-04
13.008	2.190	.1308E-03	18.858	2.674	.7501E-04
13.158	2.080	.1160E-03	19.008	2.654	.7243E-04
13.308	2.006	.1056E-03	19.158	2.651	.7063E-04
13.458	2.016	.1043E-03	19.308	2.592	.6654E-04
13.608	2.091	.1094E-03	19.458	2.570	.6411E-04
13.758	2.210	.1185E-03	19.608	2.464	.5841E-04
13.908	2.335	.1277E-03	19.758	2.339	.5220E-04
14.058	2.442	.1348E-03	19.908	2.334	.5081E-04
14.208	2.532	.1399E-03	20.058	2.299	.4833E-04
14.358	2.598	.1426E-03	20.208	2.217	.4425E-04
14.508	2.703	.1485E-03	20.358	2.095	.3891E-04
14.658	2.810	.1542E-03	20.508	2.113	.3864E-04
14.808	2.822	.1516E-03	20.658	2.103	.3741E-04
14.958	2.820	.1480E-03	20.808	2.034	.3428E-04
15.108	2.841	.1463E-03	20.958	2.053	.3411E-04
15.258	2.886	.1464E-03	21.108	2.013	.3207E-04
15.408	2.908	.1447E-03	21.258	1.991	.3068E-04
15.558	2.906	.1412E-03	21.408	1.887	.2683E-04
15.708	2.900	.1375E-03	21.558	1.814	.2407E-04
15.858	2.876	.1327E-03	21.708	1.786	.2273E-04
16.008	2.893	.1308E-03	21.858	1.786	.2220E-04
16.158	2.912	.1291E-03	22.008	1.915	.2527E-04
16.308	2.893	.1250E-03	22.158	1.820	.2214E-04
16.458	2.982	.1279E-03	22.308	1.715	.1887E-04
16.608	3.049	.1293E-03	22.458	1.602	.1554E-04
16.758	3.074	.1279E-03	22.608	1.428	.1078E-04

Table A24. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
22.758	1.431	.1062E-04	28.608	1.403	.4013E-05
22.908	1.208	.5017E-05			
23.058	1.054	.1282E-05			
23.208	1.084	.1939E-05			
23.358	1.104	.2337E-05			
23.508	1.164	.3601E-05			
23.658	1.028	.5948E-06			
23.808	1.094	.1976E-05			
23.958	1.321	.6590E-05			
24.108	1.285	.5708E-05			
24.258	1.427	.8362E-05			
24.408	1.324	.6206E-05			
24.558	1.056	.1055E-05			
24.708	1.070	.1275E-05			
24.858	1.193	.3438E-05			
25.008	1.247	.4305E-05			
25.158	.960	-.6787E-06			
25.308	1.060	.9979E-06			
25.458	.956	-.7127E-06			
25.608	.748	-.4008E-05			
25.758	.850	-.2333E-05			
25.908	.994	-.9685E-07			
26.058	1.003	.5140E-07			
26.208	.769	-.3338E-05			
26.358	.982	-.2538E-06			
26.508	1.050	.6863E-06			
26.658	.998	-.2776E-07			
26.808	.963	-.4831E-06			
26.958	.618	-.4919E-05			
27.108	.904	-.1212E-05			
27.258	1.517	.6355E-05			
27.408	1.386	.4628E-05			
27.558	1.150	.1762E-05			
27.708	1.190	.2174E-05			
27.858	1.121	.1353E-05			
28.008	1.292	.3196E-05			
28.158	1.688	.7346E-05			
28.308	1.265	.2766E-05			
28.458	.861	-.1418E-05			

Table A25. Lidar Data Taken on May 17, 1983, at GMT 0224-0244 Between 53.4°S, 168.2°E and 55.8°S, 167.1°E

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
11.117	1.044	.6514E-05	16.967	2.011	.6043E-04
11.267	1.192	.2774E-04	17.117	1.946	.5528E-04
11.417	1.302	.4244E-04	17.267	1.932	.5321E-04
11.567	1.379	.5192E-04	17.417	1.967	.5397E-04
11.717	1.420	.5624E-04	17.567	1.939	.5126E-04
11.867	1.457	.5979E-04	17.717	1.886	.4726E-04
12.017	1.498	.6360E-04	17.867	1.865	.4514E-04
12.167	1.521	.6502E-04	18.017	1.850	.4336E-04
12.317	1.528	.6443E-04	18.167	1.816	.4068E-04
12.467	1.544	.6492E-04	18.317	1.746	.3635E-04
12.617	1.561	.6540E-04	18.467	1.654	.3115E-04
12.767	1.576	.6563E-04	18.617	1.586	.2728E-04
12.917	1.605	.6742E-04	18.767	1.562	.2557E-04
13.067	1.643	.7004E-04	18.917	1.530	.2356E-04
13.217	1.701	.7460E-04	19.067	1.508	.2204E-04
13.367	1.776	.8072E-04	19.217	1.446	.1892E-04
13.517	1.832	.8458E-04	19.367	1.354	.1467E-04
13.667	1.866	.8602E-04	19.517	1.297	.1201E-04
13.817	1.885	.8588E-04	19.667	1.272	.1076E-04
13.967	1.911	.8644E-04	19.817	1.251	.9688E-05
14.117	1.934	.8652E-04	19.967	1.201	.7596E-05
14.267	1.963	.8718E-04	20.117	1.158	.5829E-05
14.417	2.032	.9125E-04	20.267	1.162	.5844E-05
14.567	2.101	.9515E-04	20.417	1.168	.5930E-05
14.717	2.129	.9528E-04	20.567	1.107	.3676E-05
14.867	2.128	.9302E-04	20.717	1.090	.3010E-05
15.017	2.121	.9032E-04	20.867	1.083	.2736E-05
15.167	2.129	.8888E-04	21.017	1.115	.3687E-05
15.317	2.146	.8818E-04	21.167	1.145	.4549E-05
15.467	2.193	.8967E-04	21.317	1.085	.2596E-05
15.617	2.255	.9211E-04	21.467	1.040	.1204E-05
15.767	2.259	.9030E-04	21.617	.993	-.2074E-06
15.917	2.283	.8989E-04	21.767	.997	-.8680E-07
16.067	2.285	.8798E-04	21.917	.942	-.1615E-05
16.217	2.239	.8289E-04	22.067	.897	-.2815E-05
16.367	2.243	.8133E-04	22.217	.947	-.1419E-05
16.517	2.220	.7804E-04	22.367	.958	-.1098E-05
16.667	2.163	.7270E-04	22.517	.938	-.1588E-05
16.817	2.083	.6619E-04	22.667	.926	-.1841E-05

Table A25. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
22.817	.932	-.1650E-05	28.667	1.214	.2111E-05
22.967	.948	-.1252E-05	28.817	1.348	.3352E-05
23.117	.985	-.3449E-06	28.967	1.328	.3095E-05
23.267	.947	-.1203E-05	29.117	1.175	.1610E-05
23.417	.955	-.9960E-06	29.267	1.172	.1546E-05
23.567	1.038	.8343E-06	29.417	1.760	.6674E-05
23.717	1.013	.2670E-06	29.567	2.010	.8672E-05
23.867	.929	-.1479E-05	29.717	1.648	.5432E-05
24.017	.996	-.8376E-07	29.867	1.537	.4401E-05
24.167	1.049	.9717E-06	30.017	1.620	.4960E-05
24.317	1.018	.3459E-06			
24.467	1.054	.1033E-05			
24.617	.972	-.5218E-06			
24.767	.923	-.1387E-05			
24.917	.923	-.1364E-05			
25.067	1.003	.5879E-07			
25.217	1.084	.1424E-05			
25.367	1.046	.7646E-06			
25.517	1.023	.3659E-06			
25.667	1.022	.3509E-06			
25.817	1.058	.8937E-06			
25.967	1.000	-.5552E-08			
26.117	.987	-.1851E-06			
26.267	.985	-.2197E-06			
26.417	.894	-.1479E-05			
26.567	.964	-.4970E-06			
26.717	1.170	.2270E-05			
26.867	1.270	.3525E-05			
27.017	1.058	.7431E-06			
27.167	.922	-.9745E-06			
27.317	1.039	.4736E-06			
27.467	.999	-.9139E-08			
27.617	.955	-.5258E-06			
27.767	1.322	.3659E-05			
27.917	1.410	.4549E-05			
28.067	1.166	.1801E-05			
28.217	1.092	.9694E-06			
28.367	1.128	.1322E-05			
28.517	1.178	.1798E-05			

Table A26. Lidar Data Taken on May 18, 1983, at GMT 0021–0043 Between 37.3°S, 174.5°E and 34.9°S, 175.2°E

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
11.721	.986	-.1927E-05	17.571	2.499	.8539E-04
11.871	1.058	.7800E-05	17.721	2.627	.9061E-04
12.021	1.119	.1553E-04	17.871	2.694	.9231E-04
12.171	1.158	.2023E-04	18.021	2.668	.8889E-04
12.321	1.182	.2278E-04	18.171	2.556	.8111E-04
12.471	1.207	.2534E-04	18.321	2.442	.7351E-04
12.621	1.255	.3057E-04	18.471	2.347	.6716E-04
12.771	1.333	.3909E-04	18.621	2.266	.6170E-04
12.921	1.411	.4725E-04	18.771	2.179	.5609E-04
13.071	1.466	.5241E-04	18.921	2.147	.5329E-04
13.221	1.510	.5608E-04	19.071	2.079	.4893E-04
13.371	1.517	.5561E-04	19.221	2.103	.4883E-04
13.521	1.499	.5256E-04	19.371	2.067	.4612E-04
13.671	1.494	.5091E-04	19.521	1.986	.4161E-04
13.821	1.490	.4926E-04	19.671	2.061	.4373E-04
13.971	1.463	.4550E-04	19.821	2.248	.5020E-04
14.121	1.446	.4282E-04	19.971	2.433	.5627E-04
14.271	1.478	.4483E-04	20.121	2.379	.5286E-04
14.421	1.519	.4758E-04	20.271	2.197	.4480E-04
14.571	1.557	.4996E-04	20.421	2.175	.4292E-04
14.721	1.613	.5364E-04	20.571	2.232	.4394E-04
14.871	1.698	.5974E-04	20.721	2.157	.4029E-04
15.021	1.804	.6721E-04	20.871	1.970	.3298E-04
15.171	1.894	.7306E-04	21.021	1.784	.2601E-04
15.321	1.992	.7924E-04	21.171	1.638	.2067E-04
15.471	2.067	.8321E-04	21.321	1.449	.1420E-04
15.621	2.104	.8419E-04	21.471	1.323	.9967E-05
15.771	2.153	.8590E-04	21.621	1.254	.7645E-05
15.921	2.196	.8704E-04	21.771	1.174	.5118E-05
16.071	2.221	.8687E-04	21.921	1.083	.2378E-05
16.221	2.235	.8581E-04	22.071	1.096	.2701E-05
16.371	2.243	.8444E-04	22.221	1.096	.2630E-05
16.521	2.266	.8416E-04	22.371	1.113	.3016E-05
16.671	2.265	.8224E-04	22.521	1.100	.2597E-05
16.821	2.236	.7859E-04	22.671	1.059	.1488E-05
16.971	2.167	.7258E-04	22.821	1.102	.2529E-05
17.121	2.080	.6573E-04	22.971	1.094	.2269E-05
17.271	2.116	.6641E-04	23.121	1.023	.5483E-06
17.421	2.307	.7611E-04	23.271	.999	-.2559E-07

Table A26. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
23.421	1.009	.2121E-06	29.271	1.093	.8214E-06
23.571	1.004	.8506E-07	29.421	1.182	.1563E-05
23.721	.975	-.5457E-06	29.571	1.284	.2385E-05
23.871	1.149	.3116E-05	29.721	1.801	.6569E-05
24.021	1.279	.5699E-05	29.871	1.828	.6628E-05
24.171	1.179	.3567E-05	30.021	1.140	.1095E-05
24.321	1.254	.4959E-05	30.171	1.394	.3007E-05
24.471	1.248	.4716E-05			
24.621	1.000	.8583E-08			
24.771	.880	-.2180E-05			
24.921	.964	-.6346E-06			
25.071	1.051	.8847E-06			
25.221	1.071	.1198E-05			
25.371	1.004	.6738E-07			
25.521	.797	-.3260E-05			
25.671	.892	-.1695E-05			
25.821	1.235	.3611E-05			
25.971	1.197	.2947E-05			
26.121	1.108	.1584E-05			
26.271	1.151	.2152E-05			
26.421	1.032	.4443E-06			
26.571	1.103	.1407E-05			
26.721	.965	-.4709E-06			
26.871	.857	-.1858E-05			
27.021	.981	-.2392E-06			
27.171	1.033	.4053E-06			
27.321	1.194	.2343E-05			
27.471	1.147	.1729E-05			
27.621	1.054	.6215E-06			
27.771	1.201	.2250E-05			
27.921	1.331	.3629E-05			
28.071	1.564	.6027E-05			
28.221	1.272	.2841E-05			
28.371	.706	-.2990E-05			
28.521	.640	-.3580E-05			
28.671	.984	-.1528E-06			
28.821	1.237	.2246E-05			
28.971	1.037	.3446E-06			
29.121	.860	-.1265E-05			

Table A27. Lidar Data Taken on May 18, 1983, at GMT 0112–0136 Between 31.5°S, 175.9°E and 28.5°S, 176.3°E

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
11.721	1.037	.5049E-05	17.571	3.546	.1450E-03
11.871	1.110	.1473E-04	17.721	3.625	.1462E-03
12.021	1.166	.2178E-04	17.871	3.794	.1522E-03
12.171	1.215	.2758E-04	18.021	3.813	.1499E-03
12.321	1.265	.3322E-04	18.171	3.685	.1400E-03
12.471	1.318	.3897E-04	18.321	3.419	.1233E-03
12.621	1.355	.4256E-04	18.471	3.224	.1109E-03
12.771	1.374	.4389E-04	18.621	3.232	.1088E-03
12.921	1.395	.4540E-04	18.771	3.310	.1099E-03
13.071	1.429	.4826E-04	18.921	3.605	.1210E-03
13.221	1.471	.5176E-04	19.071	3.856	.1295E-03
13.371	1.510	.5486E-04	19.221	3.924	.1295E-03
13.521	1.549	.5782E-04	19.371	3.431	.1051E-03
13.671	1.584	.6007E-04	19.521	2.518	.6404E-04
13.821	1.614	.6176E-04	19.671	2.055	.4346E-04
13.971	1.662	.6503E-04	19.821	2.243	.5001E-04
14.121	1.721	.6929E-04	19.971	2.311	.5148E-04
14.271	1.784	.7361E-04	20.121	2.293	.4956E-04
14.421	1.846	.7757E-04	20.271	2.240	.4641E-04
14.571	1.906	.8120E-04	20.421	2.205	.4401E-04
14.721	2.024	.8972E-04	20.571	2.171	.4178E-04
14.871	2.224	.1047E-03	20.721	2.115	.3883E-04
15.021	2.447	.1210E-03	20.871	2.117	.3797E-04
15.171	2.622	.1325E-03	21.021	2.024	.3396E-04
15.321	2.771	.1414E-03	21.171	1.886	.2870E-04
15.471	2.935	.1509E-03	21.321	1.725	.2291E-04
15.621	3.042	.1557E-03	21.471	1.690	.2128E-04
15.771	3.068	.1540E-03	21.621	1.781	.2353E-04
15.921	3.013	.1466E-03	21.771	1.729	.2144E-04
16.071	2.984	.1411E-03	21.921	1.614	.1763E-04
16.221	3.120	.1474E-03	22.071	1.580	.1625E-04
16.371	3.282	.1551E-03	22.221	1.502	.1373E-04
16.521	3.326	.1546E-03	22.371	1.530	.1414E-04
16.671	3.344	.1524E-03	22.521	1.651	.1696E-04
16.821	3.331	.1483E-03	22.671	1.616	.1566E-04
16.971	3.334	.1452E-03	22.821	1.712	.1766E-04
17.121	3.493	.1517E-03	22.971	1.704	.1705E-04
17.271	3.671	.1590E-03	23.121	1.607	.1437E-04
17.421	3.649	.1542E-03	23.271	1.700	.1617E-04

Table A27. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
23.421	1.724	.1631E-04			
23.571	1.634	.1394E-04			
23.721	1.638	.1370E-04			
23.871	1.490	.1028E-04			
24.021	1.413	.8459E-05			
24.171	1.668	.1334E-04			
24.321	1.697	.1359E-04			
24.471	1.457	.8706E-05			
24.621	1.329	.6120E-05			
24.771	1.210	.3809E-05			
24.921	1.199	.3530E-05			
25.071	1.282	.4884E-05			
25.221	1.331	.5590E-05			
25.371	1.421	.6933E-05			
25.521	1.416	.6703E-05			
25.671	1.343	.5388E-05			
25.821	1.213	.3263E-05			
25.971	1.273	.4082E-05			
26.121	1.350	.5117E-05			
26.271	1.313	.4469E-05			
26.421	1.374	.5214E-05			
26.571	1.537	.7303E-05			
26.721	1.495	.6578E-05			
26.871	1.209	.2713E-05			
27.021	.847	-.1938E-05			
27.171	.723	-.3417E-05			
27.321	.956	-.5257E-06			
27.471	1.264	.3109E-05			
27.621	1.355	.4079E-05			
27.771	1.332	.3721E-05			
27.921	1.262	.2870E-05			
28.071	.722	-.2972E-05			
28.221	.577	-.4418E-05			
28.371	1.010	.9953E-07			
28.521	1.260	.2590E-05			
28.671	1.775	.7520E-05			
28.821	1.913	.8655E-05			
28.971	1.491	.4543E-05			

Table A28. Lidar Data Taken on May 19, 1983, at GMT 0102–0125 Between 5.8°S, 167.5°W and 2.9°S, 166.5°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.050	.999	-.1199E-06	18.900	2.912	.9635E-04
13.200	1.006	.7711E-06	19.050	3.322	.1139E-03
13.350	1.011	.1336E-05	19.200	3.842	.1357E-03
13.500	1.008	.9164E-06	19.350	4.371	.1567E-03
13.650	1.003	.3490E-06	19.500	4.680	.1665E-03
13.800	1.003	.3067E-06	19.650	4.861	.1700E-03
13.950	.999	-.8740E-07	19.800	5.221	.1810E-03
14.100	.999	-.1511E-06	19.950	5.474	.1867E-03
14.250	1.001	.1222E-06	20.100	5.696	.1908E-03
14.400	.996	-.3912E-06	20.250	5.785	.1892E-03
14.550	.992	-.8583E-06	20.400	5.880	.1878E-03
14.700	.997	-.3237E-06	20.550	6.039	.1888E-03
14.850	1.014	.1393E-05	20.700	6.203	.1898E-03
15.000	1.092	.9177E-05	20.850	6.423	.1927E-03
15.150	1.446	.4348E-04	21.000	6.703	.1974E-03
15.300	2.023	.9761E-04	21.150	6.861	.1977E-03
15.450	2.438	.1342E-03	21.300	7.004	.1973E-03
15.600	2.875	.1713E-03	21.450	7.007	.1923E-03
15.750	3.564	.2292E-03	21.600	7.031	.1882E-03
15.900	4.301	.2889E-03	21.750	7.280	.1909E-03
16.050	5.011	.3435E-03	21.900	7.433	.1905E-03
16.200	5.375	.3666E-03	22.050	7.364	.1836E-03
16.350	5.150	.3403E-03	22.200	7.252	.1758E-03
16.500	4.941	.3163E-03	22.350	7.178	.1692E-03
16.650	4.298	.2586E-03	22.500	7.086	.1624E-03
16.800	3.296	.1748E-03	22.650	6.950	.1547E-03
16.950	3.129	.1573E-03	22.800	6.566	.1410E-03
17.100	2.777	.1275E-03	22.950	5.645	.1147E-03
17.250	1.881	.6136E-04	23.100	4.600	.8659E-04
17.400	1.361	.2438E-04	23.250	4.327	.7797E-04
17.550	1.428	.2808E-04	23.400	4.829	.8743E-04
17.700	1.516	.3285E-04	23.550	5.272	.9504E-04
17.850	1.576	.3563E-04	23.700	5.260	.9234E-04
18.000	1.661	.3966E-04	23.850	5.020	.8490E-04
18.150	1.752	.4378E-04	24.000	4.712	.7640E-04
18.300	1.878	.4966E-04	24.150	4.323	.6671E-04
18.450	2.078	.5918E-04	24.300	3.693	.5271E-04
18.600	2.275	.6794E-04	24.450	3.105	.4019E-04
18.750	2.533	.7935E-04	24.600	2.785	.3324E-04

Table A28. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.750	2.560	.2833E-04			
24.900	2.794	.3176E-04			
25.050	3.055	.3547E-04			
25.200	3.059	.3467E-04			
25.350	3.296	.3770E-04			
25.500	3.218	.3551E-04			
25.650	3.082	.3250E-04			
25.800	3.160	.3288E-04			
25.950	3.093	.3108E-04			
26.100	2.880	.2723E-04			
26.250	2.711	.2416E-04			
26.400	2.818	.2503E-04			
26.550	2.687	.2265E-04			
26.700	2.471	.1929E-04			
26.850	2.409	.1804E-04			
27.000	2.238	.1549E-04			
27.150	2.714	.2095E-04			
27.300	2.455	.1737E-04			
27.450	2.313	.1532E-04			
27.600	2.842	.2100E-04			
27.750	2.033	.1150E-04			
27.900	1.126	.1368E-05			
28.050	1.634	.6737E-05			
28.200	2.100	.1142E-04			
28.350	2.206	.1223E-04			
28.500	1.845	.8370E-05			
28.650	2.037	.1004E-04			
28.800	2.422	.1344E-04			
28.950	2.370	.1265E-04			
29.100	2.173	.1059E-04			
29.250	2.678	.1479E-04			
29.400	2.059	.9114E-05			
29.550	2.133	.9527E-05			
29.700	2.490	.1224E-04			
29.850	2.423	.1142E-04			
30.000	2.392	.1092E-04			
30.150	2.047	.8017E-05			

Table A29. Lidar Data Taken on May 19, 1983, at GMT 0225–0246 Between 4.3°N, 163.0°W and 6.8°N, 161.7°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.690	1.205	.2426E-04	19.540	4.235	.1428E-03
13.840	1.263	.3050E-04	19.690	4.559	.1530E-03
13.990	1.321	.3662E-04	19.840	4.922	.1642E-03
14.140	1.372	.4156E-04	19.990	5.257	.1735E-03
14.290	1.300	.3283E-04	20.140	5.660	.1850E-03
14.440	1.177	.1895E-04	20.290	5.980	.1925E-03
14.590	1.096	.1004E-04	20.440	6.246	.1975E-03
14.740	.999	-.7904E-07	20.590	6.630	.2064E-03
14.890	.957	-.4275E-05	20.740	6.799	.2070E-03
15.040	.960	-.3850E-05	20.890	6.787	.2014E-03
15.190	.987	-.1232E-05	21.040	6.799	.1969E-03
15.340	1.025	.2305E-05	21.190	6.951	.1970E-03
15.490	1.054	.4864E-05	21.340	7.154	.1988E-03
15.640	1.077	.6801E-05	21.490	7.435	.2027E-03
15.790	1.104	.8972E-05	21.640	7.488	.1994E-03
15.940	1.134	.1132E-04	21.790	7.579	.1972E-03
16.090	1.157	.1294E-04	21.940	7.736	.1969E-03
16.240	1.191	.1545E-04	22.090	7.384	.1820E-03
16.390	1.261	.2059E-04	22.240	7.036	.1679E-03
16.540	1.318	.2446E-04	22.390	7.028	.1635E-03
16.690	1.283	.2124E-04	22.540	7.116	.1618E-03
16.840	1.233	.1697E-04	22.690	7.048	.1561E-03
16.990	1.258	.1827E-04	22.840	6.906	.1487E-03
17.140	1.295	.2032E-04	22.990	6.841	.1434E-03
17.290	1.371	.2485E-04	23.140	6.784	.1385E-03
17.440	1.480	.3122E-04	23.290	6.478	.1279E-03
17.590	1.517	.3270E-04	23.440	5.909	.1118E-03
17.740	1.560	.3440E-04	23.590	5.604	.1023E-03
17.890	1.667	.3985E-04	23.740	5.540	.9840E-04
18.040	1.770	.4470E-04	23.890	5.498	.9508E-04
18.190	1.897	.5060E-04	24.040	5.332	.8932E-04
18.340	2.043	.5719E-04	24.190	5.191	.8432E-04
18.490	2.201	.6405E-04	24.340	5.021	.7893E-04
18.640	2.345	.6968E-04	24.490	4.910	.7490E-04
18.790	2.525	.7687E-04	24.640	4.795	.7093E-04
18.940	2.939	.9519E-04	24.790	4.747	.6834E-04
19.090	3.521	.1205E-03	24.940	4.469	.6173E-04
19.240	3.878	.1340E-03	25.090	4.315	.5755E-04
19.390	4.013	.1366E-03	25.240	4.180	.5388E-04

Table A29. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
25.390	3.541	.4200E-04	31.240	2.093	.7150E-05
25.540	3.281	.3678E-04			
25.690	3.449	.3854E-04			
25.840	3.376	.3649E-04			
25.990	2.931	.2893E-04			
26.140	2.713	.2503E-04			
26.290	2.743	.2486E-04			
26.440	2.672	.2327E-04			
26.590	2.731	.2350E-04			
26.740	2.911	.2534E-04			
26.890	2.853	.2399E-04			
27.040	2.759	.2224E-04			
27.190	2.445	.1784E-04			
27.340	2.068	.1288E-04			
27.490	2.235	.1455E-04			
27.640	2.499	.1725E-04			
27.790	2.213	.1363E-04			
27.940	1.870	.9548E-05			
28.090	2.252	.1342E-04			
28.240	2.348	.1412E-04			
28.390	1.833	.8525E-05			
28.540	1.695	.6940E-05			
28.690	2.244	.1214E-04			
28.840	2.795	.1711E-04			
28.990	2.293	.1204E-04			
29.140	2.115	.1014E-04			
29.290	2.551	.1378E-04			
29.440	2.108	.9611E-05			
29.590	2.080	.9148E-05			
29.740	2.641	.1358E-04			
29.890	2.228	.9929E-05			
30.040	2.110	.8767E-05			
30.190	1.957	.7376E-05			
30.340	1.656	.4938E-05			
30.490	2.209	.8892E-05			
30.640	2.082	.7776E-05			
30.790	1.910	.6389E-05			
30.940	2.398	.9584E-05			
31.090	2.126	.7536E-05			

Table A30. Lidar Data Taken on May 19, 1983, at GMT 0349–0416 Between 14.5°N, 158.3°W and 17.8°N, 156.9°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
14.269	.884	-.1278E-04	20.119	3.748	.1095E-03
14.419	.914	-.9204E-05	20.269	3.863	.1111E-03
14.569	.958	-.4413E-05	20.419	3.870	.1084E-03
14.719	1.003	.2672E-06	20.569	3.848	.1048E-03
14.869	1.042	.4181E-05	20.719	3.790	.9995E-04
15.019	1.083	.8153E-05	20.869	3.596	.9068E-04
15.169	1.126	.1203E-04	21.019	3.485	.8465E-04
15.319	1.160	.1490E-04	21.169	3.584	.8586E-04
15.469	1.167	.1524E-04	21.319	3.741	.8883E-04
15.619	1.177	.1577E-04	21.469	3.699	.8532E-04
15.769	1.248	.2155E-04	21.619	3.650	.8172E-04
15.919	1.390	.3309E-04	21.769	3.708	.8146E-04
16.069	1.647	.5368E-04	21.919	3.877	.8440E-04
16.219	1.939	.7606E-04	22.069	4.094	.8853E-04
16.369	2.098	.8690E-04	22.219	4.261	.9101E-04
16.519	2.107	.8558E-04	22.369	4.330	.9065E-04
16.669	2.081	.8135E-04	22.519	4.280	.8708E-04
16.819	2.077	.7881E-04	22.669	4.196	.8277E-04
16.969	2.021	.7258E-04	22.819	4.081	.7783E-04
17.119	1.865	.5977E-04	22.969	4.042	.7494E-04
17.269	1.752	.5052E-04	23.119	4.107	.7466E-04
17.419	1.803	.5243E-04	23.269	4.012	.7059E-04
17.569	1.965	.6127E-04	23.419	3.668	.6099E-04
17.719	2.066	.6578E-04	23.569	3.182	.4865E-04
17.869	1.970	.5816E-04	23.719	2.811	.3939E-04
18.019	1.814	.4744E-04	23.869	2.663	.3529E-04
18.169	1.836	.4736E-04	24.019	2.702	.3521E-04
18.319	1.961	.5291E-04	24.169	2.754	.3541E-04
18.469	2.113	.5956E-04	24.319	2.605	.3161E-04
18.619	2.288	.6698E-04	24.469	2.365	.2624E-04
18.769	2.465	.7414E-04	24.619	2.208	.2266E-04
18.919	2.636	.8061E-04	24.769	2.049	.1919E-04
19.069	2.793	.8604E-04	24.919	1.877	.1566E-04
19.219	2.931	.9022E-04	25.069	1.682	.1187E-04
19.369	3.043	.9294E-04	25.219	1.481	.8179E-05
19.519	3.125	.9413E-04	25.369	1.308	.5103E-05
19.669	3.225	.9599E-04	25.519	1.307	.4976E-05
19.819	3.381	.1000E-03	25.669	1.349	.5511E-05
19.969	3.577	.1054E-03	25.819	1.374	.5767E-05

Table A30. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
25.969	1.414	.6220E-05			
26.119	1.306	.4495E-05			
26.269	1.226	.3230E-05			
26.419	1.234	.3261E-05			
26.569	1.343	.4667E-05			
26.719	1.361	.4799E-05			
26.869	1.253	.3283E-05			
27.019	1.228	.2897E-05			
27.169	1.183	.2263E-05			
27.319	1.222	.2685E-05			
27.469	1.192	.2275E-05			
27.619	1.098	.1133E-05			
27.769	1.163	.1843E-05			
27.919	1.213	.2349E-05			
28.069	1.215	.2317E-05			
28.219	1.305	.3208E-05			
28.369	1.303	.3105E-05			
28.519	1.328	.3284E-05			
28.669	1.419	.4102E-05			
28.819	1.410	.3921E-05			
28.969	1.377	.3526E-05			
29.119	1.413	.3772E-05			
29.269	1.446	.3971E-05			
29.419	1.428	.3724E-05			
29.569	1.398	.3387E-05			
29.719	1.255	.2120E-05			
29.869	1.219	.1774E-05			
30.019	1.419	.3316E-05			
30.169	1.321	.2487E-05			
30.319	1.204	.1539E-05			
30.469	1.377	.2782E-05			
30.619	1.268	.1932E-05			
30.769	1.165	.1160E-05			
30.919	1.287	.1973E-05			
31.069	1.104	.7002E-06			
31.219	1.075	.4893E-06			

Table A31. Lidar Data Taken on May 21, 1983, at GMT 0109–0132 Between 30.9°N, 129.3°W and 31.8°N, 125.9°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
13.001	.969	-.3951E-05	18.851	3.426	.1191E-03
13.151	1.017	.2122E-05	19.001	3.492	.1193E-03
13.301	1.067	.8219E-05	19.151	3.507	.1171E-03
13.451	1.123	.1470E-04	19.301	3.388	.1087E-03
13.601	1.156	.1829E-04	19.451	3.193	.9736E-04
13.751	1.197	.2261E-04	19.601	3.114	.9154E-04
13.901	1.237	.2666E-04	19.751	3.148	.9069E-04
14.051	1.268	.2937E-04	19.901	3.203	.9071E-04
14.201	1.326	.3491E-04	20.051	3.344	.9410E-04
14.351	1.389	.4058E-04	20.201	3.408	.9425E-04
14.501	1.407	.4139E-04	20.351	2.776	.6781E-04
14.651	1.454	.4499E-04	20.501	2.267	.4715E-04
14.801	1.579	.5595E-04	20.651	2.052	.3820E-04
14.951	1.710	.6696E-04	20.801	1.877	.3104E-04
15.101	1.838	.7699E-04	20.951	1.835	.2881E-04
15.251	2.010	.9049E-04	21.101	1.763	.2570E-04
15.401	2.189	.1039E-03	21.251	1.703	.2307E-04
15.551	2.331	.1133E-03	21.401	1.737	.2359E-04
15.701	2.462	.1213E-03	21.551	1.821	.2563E-04
15.851	2.562	.1264E-03	21.701	1.827	.2519E-04
16.001	2.647	.1299E-03	21.851	1.713	.2117E-04
16.151	2.747	.1344E-03	22.001	1.751	.2174E-04
16.301	2.785	.1339E-03	22.151	1.891	.2517E-04
16.451	2.724	.1260E-03	22.301	1.898	.2473E-04
16.601	2.622	.1157E-03	22.451	1.976	.2623E-04
16.751	2.620	.1127E-03	22.601	2.078	.2824E-04
16.901	2.764	.1197E-03	22.751	2.214	.3101E-04
17.051	2.903	.1260E-03	22.901	2.184	.2952E-04
17.201	2.944	.1255E-03	23.051	1.822	.1999E-04
17.351	2.960	.1235E-03	23.201	1.480	.1139E-04
17.501	3.036	.1251E-03	23.351	1.221	.5103E-05
17.651	3.133	.1278E-03	23.501	1.217	.4885E-05
17.801	3.205	.1289E-03	23.651	1.598	.1314E-04
17.951	3.250	.1283E-03	23.801	1.900	.1930E-04
18.101	3.251	.1252E-03	23.951	1.843	.1763E-04
18.251	3.269	.1231E-03	24.101	1.607	.1238E-04
18.401	3.284	.1209E-03	24.251	1.561	.1118E-04
18.551	3.291	.1183E-03	24.401	1.589	.1146E-04
18.701	3.354	.1186E-03	24.551	1.554	.1052E-04

Table A31. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
24.701	1.524	.9717E-05	30.551	1.091	.6776E-06
24.851	1.451	.8168E-05	30.701	1.159	.1163E-05
25.001	1.403	.7129E-05	30.851	1.011	.7575E-07
25.151	1.417	.7199E-05	31.001	1.077	.5353E-06
25.301	1.449	.7575E-05	31.151	.803	-.1344E-05
25.451	1.502	.8276E-05	31.301	.939	-.4082E-06
25.601	1.477	.7682E-05	31.451	.993	-.4543E-07
25.751	1.472	.7425E-05	31.601	.955	-.2895E-06
25.901	1.448	.6873E-05	31.751	.978	-.1390E-06
26.051	1.384	.5753E-05			
26.201	1.397	.5815E-05			
26.351	1.209	.2983E-05			
26.501	1.161	.2245E-05			
26.651	1.007	.9709E-07			
26.801	.912	-.1175E-05			
26.951	.983	-.2229E-06			
27.101	.941	-.7499E-06			
27.251	1.029	.3543E-06			
27.401	1.170	.2070E-05			
27.551	1.033	.3871E-06			
27.701	.871	-.1498E-05			
27.851	.953	-.5346E-06			
28.001	.973	-.2956E-06			
28.151	.865	-.1457E-05			
28.301	.906	-.9978E-06			
28.451	.944	-.5779E-06			
28.601	.934	-.6655E-06			
28.751	.916	-.8284E-06			
28.901	.923	-.7397E-06			
29.051	.993	-.6730E-07			
29.201	1.075	.6895E-06			
29.351	1.033	.2966E-06			
29.501	.829	-.1504E-05			
29.651	.854	-.1252E-05			
29.801	1.171	.1436E-05			
29.951	1.231	.1897E-05			
30.101	1.098	.7829E-06			
30.251	.964	-.2783E-06			
30.401	.833	-.1275E-05			

Table A32. Lidar Data Taken on May 21, 1983, at GMT 0209–0227 Between 34.7°N, 122.3°W and 36.8°N, 121.4°W

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
10.418	1.072	.1284E-04	16.268	3.527	.1906E-03
10.568	1.161	.2816E-04	16.418	3.599	.1911E-03
10.718	1.198	.3403E-04	16.568	3.677	.1920E-03
10.868	1.207	.3503E-04	16.718	3.783	.1947E-03
11.018	1.196	.3250E-04	16.868	3.873	.1961E-03
11.168	1.175	.2853E-04	17.018	3.906	.1934E-03
11.318	1.165	.2637E-04	17.168	3.768	.1797E-03
11.468	1.158	.2487E-04	17.318	3.539	.1608E-03
11.618	1.150	.2321E-04	17.468	3.588	.1599E-03
11.768	1.141	.2134E-04	17.618	3.840	.1711E-03
11.918	1.127	.1884E-04	17.768	4.099	.1822E-03
12.068	1.112	.1642E-04	17.918	4.339	.1915E-03
12.218	1.097	.1387E-04	18.068	4.469	.1940E-03
12.368	1.079	.1105E-04	18.218	4.363	.1835E-03
12.518	1.067	.9222E-05	18.368	4.326	.1770E-03
12.668	1.052	.7011E-05	18.518	4.220	.1672E-03
12.818	1.038	.5052E-05	18.668	4.137	.1588E-03
12.968	1.044	.5648E-05	18.818	4.183	.1572E-03
13.118	1.083	.1041E-04	18.968	4.218	.1549E-03
13.268	1.157	.1935E-04	19.118	4.299	.1549E-03
13.418	1.241	.2910E-04	19.268	4.325	.1522E-03
13.568	1.282	.3327E-04	19.418	4.261	.1456E-03
13.718	1.288	.3324E-04	19.568	4.113	.1355E-03
13.868	1.285	.3221E-04	19.718	3.953	.1254E-03
14.018	1.326	.3597E-04	19.868	3.957	.1224E-03
14.168	1.472	.5083E-04	20.018	3.962	.1196E-03
14.318	1.815	.8554E-04	20.168	3.733	.1076E-03
14.468	2.275	.1304E-03	20.318	3.309	.8865E-04
14.618	2.600	.1595E-03	20.468	2.968	.7367E-04
14.768	2.760	.1711E-03	20.618	2.762	.6430E-04
14.918	2.796	.1702E-03	20.768	2.580	.5623E-04
15.068	2.779	.1644E-03	20.918	2.519	.5271E-04
15.218	2.605	.1446E-03	21.068	2.508	.5104E-04
15.368	2.422	.1249E-03	21.218	2.443	.4763E-04
15.518	2.455	.1246E-03	21.368	2.332	.4289E-04
15.668	2.653	.1380E-03	21.518	2.229	.3859E-04
15.818	2.908	.1553E-03	21.668	1.997	.3054E-04
15.968	3.125	.1686E-03	21.818	1.671	.2004E-04
16.118	3.360	.1826E-03	21.968	1.689	.2007E-04

Table A32. Concluded

Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$	Altitude, km	Scattering ratio	Scattering function, $(km\text{-}sr)^{-1}$
22.118	1.959	.2725E-04	27.968	.998	-.2741E-07
22.268	2.156	.3202E-04	28.118	1.080	.8650E-06
22.418	2.340	.3620E-04	28.268	1.215	.2289E-05
22.568	2.395	.3677E-04	28.418	1.433	.4499E-05
22.718	2.273	.3270E-04	28.568	1.149	.1509E-05
22.868	2.330	.3333E-04	28.718	.944	-.5596E-06
23.018	2.316	.3216E-04	28.868	1.102	.9915E-06
23.168	2.133	.2701E-04	29.018	1.048	.4591E-06
23.318	1.960	.2233E-04	29.168	.822	-.1650E-05
23.468	1.708	.1605E-04	29.318	.773	-.2056E-05
23.618	1.527	.1165E-04	29.468	.776	-.1983E-05
23.768	1.543	.1170E-04	29.618	.745	-.2200E-05
23.918	1.499	.1050E-04	29.768	.766	-.1976E-05
24.068	1.558	.1144E-04	29.918	1.373	.3076E-05
24.218	1.863	.1729E-04	30.068	1.135	.1088E-05
24.368	1.998	.1951E-04	30.218	1.211	.1664E-05
24.518	1.865	.1652E-04	30.368	1.792	.6099E-05
24.668	1.850	.1585E-04	30.518	1.704	.5292E-05
24.818	1.872	.1589E-04	30.668	1.512	.3760E-05
24.968	1.867	.1541E-04	30.818	1.472	.3391E-05
25.118	1.886	.1540E-04	30.968	1.583	.4089E-05
25.268	1.791	.1343E-04	31.118	1.533	.3652E-05
25.418	1.511	.8460E-05	31.268	1.167	.1116E-05
25.568	1.482	.7802E-05	31.418	1.149	.9767E-06
25.718	1.462	.7307E-05	31.568	.920	-.5129E-06
25.868	1.254	.3927E-05	31.718	1.652	.4077E-05
26.018	1.121	.1831E-05	31.868	1.439	.2684E-05
26.168	1.182	.2683E-05	32.018	.687	-.1873E-05
26.318	1.091	.1312E-05			
26.468	.964	-.5036E-06			
26.618	1.113	.1548E-05			
26.768	1.018	.2425E-06			
26.918	.935	-.8561E-06			
27.068	.973	-.3483E-06			
27.218	.962	-.4787E-06			
27.368	1.065	.7942E-06			
27.518	1.049	.5807E-06			
27.668	1.288	.3355E-05			
27.818	1.071	.8052E-06			

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16. Abstract

An experimental survey flight to determine the spatial distribution and aerosol characteristics of the El Chichon-produced stratospheric aerosol was conducted in May 1983. The mission included several different sensors flown aboard the NASA Convair 990 at latitudes between 72°N and 56°S. This report presents the lidar data from that flight mission. Representative profiles of lidar backscatter ratio, plots of integrated backscattering function versus latitude, and contours of backscatter mixing ratio versus altitude and latitude are given. In addition, tables containing numerical values of the backscatter ratio and backscattering function versus altitude are supplied for each profile. By May 1983, material produced by the El Chichon eruptions of late March-early April 1982 had spread throughout the latitudes covered by this mission. However, the most massive portion of the material resided north of 33°N and was concentrated below 21 km. In this latitude region (33°N to 72°N), peak backscatter ratios at a wavelength of 0.6943 μm varied between 3.5 and 4.5, and the peak integrated backscattering function was about 18×10^{-4} sr^{-1}, corresponding to a peak optical depth calculated to be approximately 0.08. This report presents the results of this mission in a ready-to-use format for atmospheric and climatic studies.

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