9950 - 652

Issued: November 4, 1981

RSS Tech. Report: 110481

Under Contract No. 954958

THE EFFECT OF SEA-SURFACE SUN GLITTER ON MICROWAVE RADIOMETER MEASUREMENTS

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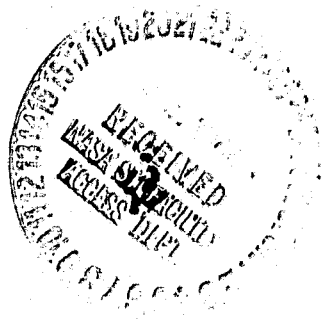

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ABSTRACT

We derive a relatively simple model for the microwave brightness temperature of sea-surface sun glitter. The model is an accurate close-form approximation for the four-fold sun glitter integral. The model computations indicate that sun glitter contamination of on-orbit radiometer measurements is appreciable over a large swath area. For winds near 20 m/s, sun glitter affects the retrieval of environmental parameters for sun angles as large as 20° to 25°. The model-predicted biases in retrieved wind speed and sea-surface temperature due to neglecting sun glitter are consistent with those experimentally observed in Seasat SMMR retrievals. A least-squares retrieval algorithm that uses a combined sea and sun model function shows the potential of retrieving accurate environmental parameters in the presence of sun glitter so long as the sun angles and wind speed are above 5° and 2 m/s, respectively.

ACKNOLEDGMENTS

This research was sponsored by the Seasat Data Utilization Project at the Jet Propulsion Laboratory under NASA Contract NAS7-100.

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SECTION 1. INTRODUCTION

Sea-surface sun glitter can be an important factor in the interpretation of on-orbit microwave radiometer measurements. The sun is very hot at microwave frequencies, being about 190,000 K at 1.4 GHz and falling off to 7,000 K at 37 GHz. These high temperatures in conjunction with a highly reflecting sea surface make sun glitter a significant component of the total sea-surface brightness temperature. When this sun glitter is within a radiometer's footprint, it must be accounted for in order to retrieve accurate environmental parameters.

In this report we first develop a relatively simple model for computing the brightness temperature (T_B) of the sun glitter. This model is a closed-form approximation for the four-fold sun glitter integral. Using the model, the sun glitter is calculated for a number of different viewing geometries and wind speeds. To determine the model accuracy, these calculations are compared with those obtained by numerically integrating the four-fold integral. Finally, we give an algorithm for retrieving environmental parameters in the presence of sun glitter.

SECTION 2. A MODEL FOR THE MICROWAVE BRIGHTNESS TEMPERATURE OF SEA-SURFACE SUN GLITTER

The two-scale scattering formulation for the microwave brightness temperature (T_B) of sea-surface sun glitter is given by Wentz [1978]. The formulation consists of two, 2-dimensional integrations, one over the sun's solid angle and the other over the radiometer's antenna pattern. This four-fold integration requires considerable computer time and makes analysis difficult. To simplify the problem, we derive an accurate close-form approximation to the four-fold integral. The approximation takes advantage of the fact that the angular widths of the sun and the antenna patterns we consider are small. In the derivation we use the same notation as in Wentz [1978], except that the subscript ⊙ is denoted herein by subscript $*$, the sun's angular radius $\psi_\odot$ is denoted by $\Delta\alpha$, and the antenna angle θ_b is denoted by β. When referring to equations in Wentz [1978], we use the prime symbol, i.e., 8'. The reader should refer to Wentz [1978] for complete definitions of the symbols used herein.

Our first approximation is to replace the T_B distribution of the sun given by (8') with a Gaussian distribution

$$T_*(k_i) = T_* \, w \exp(-w\alpha^2/\Delta\alpha^2) \qquad (1)$$

where T_* is the sun's mean T_B, w is a shaping coefficient, α is the angle (in radians) made by the unit vectors $-k_i$ and k_*, and $\Delta\alpha$ is the angular radius (in radians) of the sun. The vector $-k_i$ points from the sea surface to the sun and varies over the sun's solid angle. The sun vector k_* is a constant vector pointing from the surface to the sun's center. A least-

squares fit of (1) to (8') gives w = ln 4. The Gaussian distribution is of appreciable size only for small angles α, and hence α can be approximated by

$$\alpha^2 = [(u^x)^2 + (u^y)^2 - (k_s^y u^x - k_s^x u^y)^2]/(k_s^z)^2 \tag{2}$$

$$u = k_i + k_s \tag{3}$$

The superscripts x, y, and z denote the three components of the vectors. The z-axis points upward along the normal to the mean sea surface.

The next approximation is for the antenna pattern given by (4'). The following expression replaces (4'):

$$G(k_b,-k_s) = G_0 \exp(-\beta^2/\Delta\beta^2) \tag{4}$$

where G_0 is the boresight gain, β is the angle between the unit vectors k_b and $-k_s$, and $\Delta\beta$ is the 1/e angular radius of the antenna pattern. The vector $-k_s$ points from the antenna to the sea surface and varies over the solid angle of the antenna pattern. The vector k_b is constant and points along the boresight of the antenna towards the surface. The Gaussian distribution is of appreciable size only for small angles β, and hence β can be approximated by

$$\beta^2 = [(v^x)^2 + (v^y)^2 - (k_b^y v^x - k_b^x v^y)^2]/(k_b^z)^2 \tag{5}$$

$$v = k_s + k_b \tag{6}$$

The third approximation involves the sea-surface slopes given by (27') and (28'). The slope probability is appreciably only for small slopes and hence the slopes can be approximated by

$$Z_x = -(k_s^x - k_i^x)/(k_\odot^z - k_b^z) \tag{7}$$

$$Z_y = -(k_s^y - k_i^y)/(k_\odot^z - k_b^z) \tag{8}$$

Approximations (1) through (8) are substituted into the four-fold integral (2'). All other terms in the integrand, which are slowly varying, are set to constant values assuming $k_i = -k_\odot$ and $k_s = -k_b$. Having done this, the integrand becomes a product of three bivariant Gaussian distributions, which are functions of the integration variables k_i^x, k_i^y, k_s^x, and k_s^y. This integral has the following closed-form solution

$$T_{glt} = T_\odot \, \Delta\alpha^2 \, R \, [(1-ar-ct)/(t-c)]^2 \exp(-A/B)/\sqrt{Bt^3} \tag{9}$$

where T_{glt} is the brightness temperature of the sun glitter observed by the antenna. This quantity is denoted by $T_A(k_b,P)$ in Wentz [1978]. The sea-surface power reflectivity R is given in the next paragraph. The remaining terms in (9) are functions of the following:

1. The sun's mean brightness temperature $T_\odot$ in Kelvin
2. The sun's angular radius $\Delta\alpha$ in radians
3. The sun vector $k_\odot$ that points from the sea surface to the sun's center
4. The antenna boresight vector k_b that points from the antenna to the surface

5. The half-power antenna beam width ω in radians

6. The large-scale sea-surface slope variance $\langle Z^2 \rangle$

To simplify the notation herein, we represent k_a and k_b by

$$k_a = [a,o,c] \tag{10}$$

$$k_b = [r,s,t] \tag{11}$$

where we have required that the sun vector lie in the x-z plane of the chosen coordinate system. The terms A and B are given by

$$A = [(r-a)^2 + s^2c^2](\Delta_1+\Delta_2+\Delta_3) + a^2s^2\Delta_3 \tag{12}$$

$$B = t^2\Delta_1^2 + \Delta_2^2 + c^2\Delta_3^2 + (1+t^2)\Delta_1\Delta_2 + (c^2+t^2+a^2s^2)\Delta_1\Delta_3 + (1+c^2)\Delta_2\Delta_3 \tag{13}$$

$$\Delta_1 = \omega^2/(4 \ln 2) \tag{14}$$

$$\Delta_2 = (t-c)^2\langle Z^2 \rangle \tag{15}$$

$$\Delta_3 = \Delta\alpha^2/\ln 4 \tag{16}$$

The power reflectivity coefficient R is given by the vector dot products

$$R = (1-\rho)\ (|P\cdot H|^2\ |R_h|^2 + |P\cdot V|^2\ |R_v|^2) \tag{17}$$

where P is the polarization mode vector of the antenna, H and V are the

horizontal and vertical polarization vectors of the tilted sea-surface facet, and R_h and R_v are the horizontal and vertical complex Fresnel reflection coefficients. The term ρ is the effective fractional coverage of non-reflecting sea foam. For an h-pol observation, the polarization mode vector is given by the following vector cross products:

$$P = -k_b x Z / |k_b x Z| \tag{18}$$

where Z is the z-axis unit vector, which is normal to the mean sea surface. For v-pol observations,

$$P = k_b x (k_b x Z) / |k_b x Z| \tag{19}$$

The local polarization vectors are given by

$$H = -k_b x N / |k_b x N| \tag{20}$$

$$V = -k_b x H \tag{21}$$

$$N = (k_s - k_b) / |k_s - k_b| \tag{22}$$

where N is the local surface normal. The Fresnel coefficients R_h and R_v are functions of the sea water dielectric constant ϵ and the local incidence angle θ_i given by

$$\cos \theta_i = k_s \cdot N \tag{23}$$

In summary, equation (9) and supporting equations (10) through (23) give the brightness temperature of sun glitter received by an antenna as a function of the following parameters, which have been defined above:

1. Mean brightness temperature of the sun, T_s (K)
2. Angular radius of sun, $\Delta\alpha$ (radians)
3. Unit sun vector pointing from the sea surface to the sun, $\mathbf{k}_s$
4. Unit boresight vector pointing from the antenna to the surface, $\mathbf{k}_b$
5. Half-power antenna beam width, ω (radians)
6. Large-scale sea-surface slope variance, $\langle Z^2 \rangle$
7. Dielectric constant of sea water, ε
8. Effective fractional coverage of sea foam, ρ

SECTION 3. COMPUTATION OF SUN GLITTER BRIGHTNESS TEMPERATURES

In this section, tables of the sun glitter T_B are computed using (9). These computations from the simplified model are then compared with those obtained by numerically integrating the four-fold brightness temperature equation. The computations require that the eight parameters listed at the end of Section 2 be specified. Table 1 gives the values of the frequency dependent parameters for the five Seasat SMMR frequencies. The dielectric constant ε of sea water, which is not shown in Table 1, also depends on frequency. Its value is calculated according to the expressions given by Klein and Swift [1977] assuming a sea-surface temperature of 290 K and a salinity of 34 $^{o}/_{oo}$. The values of the sun's mean brightness temperature $T_\odot$ given in Table 1 come from Stacey [1977]. The antenna half-power beam width ω are those given by Njoku et al. [1980] for the Seasat SMMR. The slope variance coefficient g in Table 1 is used to specify the large-scale sea-surface slope variance $\langle Z^2 \rangle$ by means of the following expression:

$$\langle Z^2 \rangle = gU_* \tag{24}$$

where U_* is the sea-surface friction velocity. The g values come from Wentz [1981]. The foam coefficient γ accounts for the slight modification of the sea-surface reflectivity due to sea foam via the expression

$$\rho = \gamma U_* \tag{25}$$

where ρ is the effective fractional coverage of non-reflecting sea foam. The γ values come from Wentz [1981].

Table 1. Frequency Dependent Parameters for the Sun Glitter Model

Frequency (GHz)	Sun T_B $T_\odot$ (K)	Antenna Beamwidth ω (degrees)	Slope Variance Coeff. s (s/cm)	Foam Coeff. γ (s/cm)
6.6	22000	4.53	3.57×10^{-4}	6×10^{-4}
10.7	15000	2.92	6.86×10^{-4}	6×10^{-4}
18	11000	1.80	8.00×10^{-4}	7×10^{-4}
21	10000	1.50	9.05×10^{-4}	7×10^{-4}
37	7000	0.93	12.23×10^{-4}	11×10^{-4}

The remaining model parameters are the sun's angular radius $\Delta\alpha$, the sun vector $\mathbf{k}_s$, and the antenna boresight vector $\mathbf{k}_b$. At microwave frequencies the sun's angular radius is 0.293°, which is 10% greater than the optical angular radius [Aarons, 1965]. The two vectors $\mathbf{k}_s$ and $\mathbf{k}_b$ are treated as model variables. The vectors' components defined by (10) and (11) are related to incidence and azimuth viewing angles through the following expressions:

$$a = \sin\theta_s \tag{26}$$

$$c = \cos\theta_s \tag{27}$$

$$r = \sin\theta_b \cos\phi \tag{28}$$

$$s = \sin\theta_b \sin\phi \tag{29}$$

$$t = -\cos\theta_b \tag{30}$$

where θ_s and θ_b are the incidence angles of the sun's radiation and the antenna boresight, respectively, relative to the mean sea surface. The angle ϕ is the angle made by the projection of $\mathbf{k}_s$ onto the mean sea surface and the projection of $\mathbf{k}_b$ onto the mean sea surface. This angle is called the relative azimuth angle. Hence the model depends upon $\mathbf{k}_s$ and $\mathbf{k}_b$ through three angles, θ_s, θ_b, and ϕ. For the Seasat SMMR, the boresight incidence angle θ_b is a constant 49°. Hence only θ_s and ϕ are variable.

Tables of the sun glitter brightness temperature that is received by the SMMR antenna are given in the Appendix. There are 30 tables corresponding to the five SMMR frequencies, two SMMR polarizations, and 3 viewing geometries (5x2x3=30). The polarization dependence arises because the

Fresnel reflectivity is different for horizontal and vertical polarization, with the horizontal polarization reflectivity being higher. The three viewing geometries are the following:

1. The sun vector k_s in the plane of incidence of the boresight vector k_b so that $\phi = 0°$, and θ_s varies from 49° to 79°.
2. The sun vector k_s in the plane of incidence of the boresight vector k_b so that $\phi = 0°$, and θ_s varies from 49° to 19°.
3. The sun vector k_s not in the plane of incidence, ϕ varies from 0° to 40.1°, and θ_s is a constant 49°.

For each of these geometries, the sun angle is defined as the angle made by the sun vector k_s and the reflection vector k_r for the boresight vector reflecting off a specular sea surface. The reflection vector is given by

$$k_r = k_b - 2(k_b \cdot Z)Z \tag{31}$$

The dot product of k_r and k_s defines the sun angle Ω

$$\begin{aligned} \cos \Omega &= k_r \cdot k_s \\ &= \sin \theta_s \sin \theta_b \cos \phi + \cos \theta_s \cos \theta_b \end{aligned} \tag{32}$$

In each of the 30 tables, the sun glitter T_B is given for 30 sun angles and 12 wind speeds. The sun angles Ω go from 0° to 30° in 1° steps. Table 2 gives the 12 wind speeds and their corresponding friction velocities assuming an anemometer height of 19.5 meters and a neutrally stable atmosphere [Cardone, 1969]. A specular surface is assumed for the zero wind speed case.

Table 2. Wind Speeds and Friction Velocities

Wind Speed (m/s)	Friction Velocity U_* (cm/s)
0	0
1	4.1
2	7.5
4	13.5
6	19.2
8	26.6
10	36.2
12	46.4
15	62.6
20	92.0
25	124.2
30	159.4

The tables show that significant sun glitter exists for sun angles out to 25°, particularly at the lower frequencies and horizontal polarization. This persistence of sun glitter at large angles means that a sun glitter correction for an on-orbit radiometer is required over a large swath area. In the following section a correction technique for removing the sun glitter contamination is described.

Sun glitter brightness temperatures are also computed by numerically integrating the four-fold brightness temperature equation. The results from the numerical integrations are then compared with those obtained from the simplified model (9). For wind speeds above 5 m/s, the difference between the integrate values and those given by (9) is 0.1 K or less. For a wind speed of 2 m/s, the difference is about 0.1 K or 2%, whichever is greater. For zero wind speed, the difference is about 1 K or 4%, whichever is greater. For low wind speeds and small sun angles, the percent error is more meaningful because the magnitude of the sun glitter is very large. These errors between the integral formulation and the close-form expression are certainly less than errors due to uncertainties in model parameters such as the sun brightness temperature $T_\odot$ and the slope variance $\langle Z^2 \rangle$. In view of its accuracy, approximation (9) is a very useful tool for computing and analyzing sea-surface sun glitter.

SECTION 4. SUN GLITTER CORRECTION ALGORITHM

The least-squares geophysical algorithm for the Seasat SMMR finds the environmental parameter vector P that minimizes the following sum of squares:

$$SOS = \sum_{i=1}^{10} [M_i - F(P,O_i)]^2/\Delta_i^2 \qquad (33)$$

where M_i is the T_B measurement, $F(P,O_i)$ is the model function corresponding to the M_i measurement, O_i is the observation vector for the measurement, and Δ_i^2 is the expected variance between the measurement and model function due to measurement and modeling error. The summation is over the 10 SMMR channels whose footprints fall within a 150 km resolution cell. The environmental vector P has four components: wind speed, sea-surface temperature, atmospheric water vapor, and atmospheric liquid water. The observation vector O_i consists of the sensor's frequency, polarization, and viewing direction. The model function computes an expected value for the measurement given the environmental and observation vectors.

When sun glitter is present in the footprint of the radiometer, the model function $F(P,O_i)$ should consist of two components

$$F(P,O_i) = F_{sea}(P,O_i) + F_{sun}(P,O_i) \qquad (34)$$

where F_{sea} is the brightness temperature model function for the sea and intervening atmosphere and F_{sun} is the model function for the sun glitter. The sea T_B model function is given by Wentz [1981]. The sun model function

is given by

$$T_{sun}(P,\theta_i) = \tau(\theta_s,P,\theta_i)\,\tau(\theta_b,P,\theta_i)\,T_{glit} \qquad (35)$$

where T_{glit} comes from (9). The transmittances $\tau(\theta_s,P,\theta_i)$ and $\tau(\theta_b,P,\theta_i)$ account for the atmospheric transmittance along the slant path of the incident solar radiation and along the slant path of the antenna boresight, respectively. This two-way transmittance factor reduces the sun glitter when atmospheric attenuation is significant. The transmittance function is given by Wentz [1981] in terms of the slant path incidence angle, the water vapor content, the liquid water content, and the SMMR channel. Note that in addition to P, θ_i, and constant model parameters, the evaluation of the sun glitter model function also requires that the sun's incidence angle θ_s and the relative azimuth angle ϕ be known.

In principle, using the combined sea and sun model function, rather that just the sea model function, should provide accurate environmental parameters when sun glitter is present. In practice, the performance of the combined model depends on how accurately the model depicts the real world. Determining the accuracy of the sun glitter model is a major effort, requiring the processing of actual SMMR data and subsequent analysis. Such an effort is beyond the scope of this initial study. However, we do perform some simple simulations to determine the magnitude of the sun glitter effect on the geophysical retrieval and to determine the convergence characteristics of the combined model function.

The simulations consider two viewing geometries, seven sun angles, and six wind speeds. The two viewing geometries are:

1. The sun vector in the plane of incidence of the boresight vector so that $\phi = 0°$, and θ_s varies from 49° to 74°.
2. The sun vector not in the plane of incidence, ϕ varies from 0° to 33.3°, and θ_s is a constant 49°.

The seven sun angles are 0°, 2°, 5°, 10°, 15°, 20°, and 25°. The six wind speeds are 0, 2, 5, 10, 15, and 20 m/s.

In the first set of simulations, the combined sea and sun brightness temperatures are calculated from (34) for the 10 SMMR channels. The sea surface temperature, water vapor content, and liquid water content are set at 290 K, 3 g/cm², and 10 mg/cm². The 10 simulated brightness temperatures are then processed by the least-squares algorithm. However, the model function used by the least-squares algorithm contains only the sea T_B component, i.e., F_{sun} is set to zero in the least-squares algorithm. In this way, we can determine the effect of neglecting sun glitter in the geophysical retrieval. Tables 3 through 6 give the resulting errors in the retrieved sea-surface temperature, wind speed, water vapor, and liquid water, respectively.

As can be seen from the tables, the errors are largest for low wind speeds and small sun angles and are smallest for low wind speeds and large sun angles. For high wind speeds, the retrieval error is less sensitive to the sun angle. The asterisks in Tables 3 through 6 for the two lowest sun angles and wind speeds indicate that the least-squares algorithm did not converge because of the large sun glitter contamination. The sun glitter contamination always causes the wind estimate to be too high. Usually the sea-surface temperature and water vapor are also biased high, although in some instances they are biased low. In general, the estimated liquid water is too small. The wind speed estimate is especially sensitive to sun

Table 3. Error in Retrieved Sea-Surface Temperature (K) Due to Sun Glitter

Sun Vector in Plane of Incidence

Sun Angle (deg)	Wind Speed (m/s)					
	0	2	5	10	15	20
0	***	***	3.1	3.7	0.2	-0.7
2	***	***	3.0	3.5	0.0	-0.9
5	5.7	3.9	4.4	3.4	-0.2	-1.1
10	0.0	3.0	4.9	3.8	-0.3	-1.2
15	0.0	0.1	1.0	2.0	-0.1	-1.2
20	0.0	0.0	0.1	0.6	0.3	-1.1
25	0.0	0.0	0.0	0.1	0.3	-0.8

Sun Vector Not in Plane of Incidence

Sun Angle (deg)	Wind Speed (m/s)					
	0	2	5	10	15	20
0	***	***	3.1	3.7	0.2	-0.7
2	***	***	4.1	3.9	0.3	-0.7
5	4.9	8.6	7.2	4.6	0.5	-0.6
10	0.0	0.5	1.8	2.9	1.0	-0.3
15	0.0	0.0	0.1	0.7	1.0	0.0
20	0.0	0.0	0.0	0.1	0.4	0.1
25	0.0	0.0	0.0	0.0	0.1	0.1

Table 4. Error in Retrieved Wind Speed (m/s) Due to Sun Glitter

Sun Vector in Plane of Incidence

Sun Angle (deg)	Wind Speed (m/s)					
	0	2	5	10	15	20
0	***	***	24.4	11.4	6.4	4.1
2	***	***	23.5	11.2	6.4	4.1
5	12.5	26.8	19.0	10.2	6.1	4.0
10	0.0	7.6	9.4	7.0	5.0	3.5
15	0.0	0.5	3.1	3.9	3.5	2.8
20	0.0	0.0	0.5	1.6	2.1	2.0
25	0.0	0.0	0.1	0.5	1.1	1.3

Sun Vector Not in Plane of Incidence

Sun Angle (deg)	Wind Speed (m/s)					
	0	2	5	10	15	20
0	***	***	24.4	11.4	6.4	4.1
2	***	***	22.3	10.9	6.3	4.0
5	10.4	17.4	14.2	8.5	5.4	3.6
10	0.0	0.8	3.1	3.6	3.1	2.5
15	0.0	0.0	0.1	0.7	1.2	1.3
20	0.0	0.0	0.0	0.1	0.3	0.5
25	0.0	0.0	0.0	0.0	0.0	0.2

Table 5. Error in Retrieved Water Vapor (g/cm^2) Due to Sun Glitter

Sun Vector in Plane of Incidence

Sun Angle (deg)	Wind Speed (m/s)					
	0	2	5	10	15	20
0	****	****	1.08	0.44	0.43	0.36
2	****	****	0.99	0.43	0.43	0.36
5	0.39	0.60	0.52	0.32	0.39	0.35
10	0.00	-0.26	-0.13	0.04	0.27	0.29
15	0.00	-0.07	-0.13	-0.06	0.12	0.21
20	0.00	-0.01	-0.05	-0.07	0.01	0.12
25	0.00	0.00	-0.01	-0.05	-0.04	0.06

Sun Vector Not in Plane of Incidence

Sun Angle (deg)	Wind Speed (m/s)					
	0	2	5	10	15	20
0	****	****	1.08	0.44	0.43	0.36
2	****	****	0.86	0.39	0.41	0.35
5	0.33	-0.03	0.12	0.17	0.32	0.31
10	0.00	-0.07	-0.12	-0.06	0.10	0.18
15	0.00	0.00	-0.03	-0.07	-0.04	0.06
20	0.00	0.00	0.00	-0.03	-0.04	0.00
25	0.00	0.00	0.00	-0.01	-0.02	-0.02

Table 6. Error in Retrieved Liquid Water (mg/cm²) Due to Sun Glitter

Sun Vector in Plane of Incidence

Sun Angle (deg)	Wind Speed (m/s)					
	0	2	5	10	15	20
0	***	***	-58.3	-28.3	-18.4	-13.5
2	***	***	-54.5	-27.4	-18.2	-13.4
5	-27.9	-46.4	-38.6	-23.2	-16.7	-12.8
10	0.0	1.6	-8.4	-11.9	-12.3	-10.7
15	0.0	2.0	1.5	-3.7	-7.0	-7.7
20	0.0	0.2	1.4	0.1	-2.7	-4.8
25	0.0	0.0	0.4	0.9	-0.4	-2.5

Sun Vector Not in Plane of Incidence

Sun Angle (deg)	Wind Speed (m/s)					
	0	2	5	10	15	20
0	***	***	-58.5	-28.3	-18.4	-13.5
2	***	***	-51.6	-26.5	-17.7	-13.2
5	-22.4	-22.7	-24.5	-18.1	-14.5	-11.6
10	0.0	1.7	1.1	-3.7	-6.5	-7.2
15	0.0	0.1	1.1	1.2	-0.7	-2.9
20	0.0	0.0	0.1	0.9	0.9	-0.4
25	0.0	0.0	0.0	0.3	0.7	0.5

glitter because of the similarity between the wind speed microwave signature and the sun glitter signature. The change in T_B due to wind speed and that due to sun glitter are both larger for horizontal polarization than vertical polarization. As mentioned before, for high wind speeds the sun glitter is a significant factor even for sun angles as large as 20° or 25°.

The predicted biases in wind speed and sea-surface temperature due to neglecting sun glitter have been experimentally observed in the Seasat SMMR data. Wentz et al. [1982] discusses how sun glitter in the North Atlantic causes the SMMR-inferred wind speeds to be high relative to the winds inferred by the Seasat Scatterometer SASS. In another study, SMMR-inferred sea-surface temperatures for sun angles between 10° and 25° in the North Cental Pacific were biased 1 K high relative to XBT measurements. The typical wind speed for these North Central Pacific measurements was about 10 m/s, and hence the observed 1 K bias is consistent with that shown in Table 3 for sun angles between 10° and 25°.

The second set of simulations are the same as the first except that the combined sea and sun T_B model is used in the retrieval algorithm. Since the same model is used to generate the data and invert the data, one expects perfect retrievals. For all cases except the three smallest sun angles and the two lowest wind speeds, perfect retrievals are indeed obtained. However for sun angles of 0°, 2°, and 5° and wind speeds of 0 and 2 m/s, the least-squares algorithm does not converge due to the strong nonlinearity of the sun T_B function that occurs for these cases. These closure simulations establish the feasibiliy of retrieving accurate environmental parameters in the presence of sun glitter so long as the sun angle and wind speed are not too small.

SECTION 5. CONCLUSIONS

Based on the results of this study, we conclude the following:

1. The four-fold integral for the brightness temperature of sun glitter can be accurately approximated by a close-form expression.

2. Sun glitter contamination of on-orbit microwave radiometer measurements is appreciable over a large swath area. At high wind speeds near 20 m/s, the retrieval of environmental parameters is affected by sun glitter for sun angles as large as 20° to 25°.

3. The estimation of wind speed, as compared to other environmental parameters, is most sensitive to sun glitter.

4. The predicted biases in retrieved wind speed and sea-surface temperature due to neglecting sun glitter are consistent with those experimentally observed in the Seasat SMMR retrievals.

5. Closure simulations establish the feasibility of retrieving accurate environmental parameters in the presence of sun glitter so long as the sun angle and wind speed are above 5° and 2 m/s, respectively.

REFERENCES

Aarons, J., Solar System Radio Astronomy, Plenum, New York, pp. 49-85, 1965.

Cardone, V.J., 'Specification of the Wind Field Distribution in the Marine Boundary Layer for Wave Forecasting', Rep. TR 69-1, Geophysical Sciences Laboratory, New York University, New York, 1969.

Klein, L.A., and C.T. Swift, 'An Improved Model for the Dielectric Constant of Sea Water at Microwave Frequencies, IEEE Trans. Antennas Propagat., AP-25, pp. 104-111, 1977.

Njoku, E., J.M Stacey, and F.T. Barath, 'The Seasat Scanning Multichannel Microwave Radiometer (SMMR): Instrument Description and Performance', IEEE Journal of Oceanic Eng., OE-5 (2), pp. 100-115, 1980.

Stacey, J., 'Sun and the Moon in the Sky Calibration Horn', JPL Tech. Memo 622-104, JPL, Pasadena, CA, October 1977.

Wentz, F.J., 'The Forward Scattering of Microwave Solar Radiation from a Water Surface', Radio Science, 13(1), pp. 131-138, 1978.

Wentz, F.J., 'Model Function for Ocean Microwave Brightness Temperatures', RSS Tech. Report, Remote Sensing Systems, Sausalito, CA, August, 1981.

Wentz, F.J., V.J. Cardone, and L.S. Fedor, 'Intercomparison of Wind Speeds Inferred by the SASS, Altimeter and SMMR', Journal of Geophysical Research, Seasat Special Issue (Ed. B. Bernstein), 1982.

APPENDIX

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 6.6 POL = V
SUN INCIDENCE ANGLE = 49 TO 79 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	126.6	45.8	30.2	18.9	13.9	10.3	7.7	6.1	4.5	3.1	2.2	1.7
1	108.1	43.5	29.1	18.4	13.7	10.2	7.6	6.0	4.5	3.0	2.2	1.7
2	71.6	38.4	26.8	17.5	13.1	9.9	7.5	5.9	4.4	3.0	2.2	1.7
3	37.5	31.5	23.6	16.1	12.4	9.4	7.2	5.7	4.3	2.9	2.2	1.7
4	15.7	24.1	19.9	14.5	11.4	8.8	6.8	5.5	4.2	2.9	2.1	1.6
5	5.4	17.2	16.0	12.7	10.3	8.2	6.5	5.2	4.0	2.8	2.1	1.6
6	1.5	11.4	12.3	10.7	9.1	7.5	6.0	5.0	3.8	2.7	2.0	1.6
7	.4	7.1	9.1	8.9	7.9	6.7	5.5	4.6	3.7	2.6	2.0	1.5
8	.1	4.2	6.4	7.1	6.7	6.0	5.1	4.3	3.4	2.5	1.9	1.5
9	.0	2.3	4.3	5.6	5.6	5.2	4.6	4.0	3.2	2.4	1.8	1.4
10	.0	1.2	2.8	4.3	4.6	4.5	4.1	3.6	3.0	2.3	1.8	1.4
11	.0	.6	1.7	3.2	3.7	3.8	3.6	3.3	2.8	2.1	1.7	1.4
12	.0	.3	1.0	2.3	2.9	3.2	3.1	2.9	2.6	2.0	1.6	1.3
13	.0	.1	.6	1.6	2.2	2.6	2.7	2.6	2.3	1.9	1.5	1.2
14	.0	.0	.3	1.1	1.7	2.1	2.3	2.3	2.1	1.8	1.5	1.2
15	.0	.0	.2	.7	1.2	1.7	1.9	2.0	1.9	1.6	1.4	1.1
16	.0	.0	.1	.5	.9	1.3	1.6	1.7	1.7	1.5	1.3	1.1
17	.0	.0	.0	.3	.6	1.0	1.3	1.5	1.5	1.4	1.2	1.0
18	.0	.0	.0	.2	.5	.8	1.1	1.2	1.3	1.3	1.1	1.0
19	.0	.0	.0	.1	.3	.6	.9	1.0	1.2	1.2	1.1	.9
20	.0	.0	.0	.1	.2	.4	.7	.9	1.0	1.1	1.0	.9
21	.0	.0	.0	.0	.1	.3	.5	.7	.9	.9	.9	.8
22	.0	.0	.0	.0	.1	.2	.4	.6	.8	.8	.8	.8
23	.0	.0	.0	.0	.1	.2	.3	.5	.6	.8	.8	.7
24	.0	.0	.0	.0	.0	.1	.2	.4	.5	.7	.7	.7
25	.0	.0	.0	.0	.0	.1	.2	.3	.5	.6	.6	.6
26	.0	.0	.0	.0	.0	.1	.1	.2	.4	.5	.6	.6
27	.0	.0	.0	.0	.0	.0	.1	.2	.3	.5	.5	.5
28	.0	.0	.0	.0	.0	.0	.1	.1	.3	.4	.5	.5
29	.0	.0	.0	.0	.0	.0	.1	.1	.2	.3	.4	.4
30	.0	.0	.0	.0	.0	.0	.0	.1	.2	.3	.4	.4

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 6.6 POL = V
SUN INCIDENCE ANGLE = 49 TO 29 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	126.6	45.8	30.2	18.9	13.9	10.3	7.7	6.1	4.5	3.1	2.2	1.7
1	113.4	44.7	29.8	18.8	13.9	10.4	7.8	6.1	4.6	3.1	2.3	1.7
2	76.5	40.5	28.1	18.2	13.6	10.2	7.7	6.1	4.5	3.1	2.3	1.7
3	38.2	34.0	25.3	17.1	13.1	9.9	7.6	6.0	4.5	3.1	2.3	1.7
4	13.9	26.4	21.7	15.7	12.3	9.5	7.3	5.9	4.4	3.1	2.2	1.7
5	3.6	18.9	17.7	13.9	11.3	8.9	7.0	5.7	4.3	3.0	2.2	1.7
6	.7	12.5	13.7	12.0	10.2	8.3	6.6	5.5	4.2	3.0	2.2	1.7
7	.1	7.6	10.2	10.1	9.0	7.6	6.2	5.2	4.1	2.9	2.2	1.7
8	.0	4.3	7.2	8.2	7.7	6.8	5.8	4.9	3.9	2.8	2.1	1.7
9	.0	2.2	4.8	6.5	6.5	6.0	5.3	4.6	3.7	2.7	2.1	1.7
10	.0	1.0	3.0	4.9	5.4	5.3	4.8	4.2	3.5	2.6	2.0	1.6
11	.0	.5	1.8	3.7	4.4	4.5	4.3	3.9	3.3	2.5	2.0	1.6
12	.0	.2	1.1	2.7	3.5	3.8	3.8	3.5	3.1	2.4	1.9	1.6
13	.0	.1	.6	1.9	2.7	3.2	3.3	3.2	2.9	2.3	1.9	1.5
14	.0	.0	.3	1.3	2.0	2.6	2.8	2.8	2.6	2.2	1.8	1.5
15	.0	.0	.1	.8	1.5	2.1	2.4	2.5	2.4	2.1	1.7	1.4
16	.0	.0	.1	.5	1.1	1.6	2.0	2.2	2.2	1.9	1.7	1.4
17	.0	.0	.0	.3	.8	1.3	1.7	1.9	2.0	1.8	1.6	1.3
18	.0	.0	.0	.2	.5	1.0	1.4	1.6	1.8	1.7	1.5	1.3
19	.0	.0	.0	.1	.4	.7	1.1	1.4	1.6	1.6	1.4	1.2
20	.0	.0	.0	.1	.2	.5	.9	1.2	1.4	1.4	1.3	1.2
21	.0	.0	.0	.0	.2	.4	.7	1.0	1.2	1.3	1.3	1.1
22	.0	.0	.0	.0	.1	.3	.6	.8	1.1	1.2	1.2	1.1
23	.0	.0	.0	.0	.1	.2	.4	.7	.9	1.1	1.1	1.0
24	.0	.0	.0	.0	.0	.1	.3	.5	.8	1.0	1.0	1.0
25	.0	.0	.0	.0	.0	.1	.2	.4	.7	.9	.9	.9
26	.0	.0	.0	.0	.0	.1	.2	.3	.6	.8	.9	.9
27	.0	.0	.0	.0	.0	.0	.1	.3	.5	.7	.8	.8
28	.0	.0	.0	.0	.0	.0	.1	.2	.4	.6	.7	.8
29	.0	.0	.0	.0	.0	.0	.1	.2	.3	.5	.7	.7
30	.0	.0	.0	.0	.0	.0	.0	.1	.3	.5	.6	.7

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 6.6 POL = V
SUN INCIDENCE ANGLE = CONSTANT 49 DEG. SUN AZIMUTH ANGLE = 0 TO 40.1 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	126.6	45.8	30.2	18.9	13.9	10.3	7.7	6.1	4.5	3.1	2.2	1.7
1	110.8	43.0	28.9	18.4	13.6	10.2	7.7	6.0	4.5	3.1	2.2	1.7
2	74.2	35.6	25.3	16.9	12.8	9.7	7.4	5.9	4.4	3.0	2.2	1.7
3	38.0	26.0	20.4	14.7	11.5	9.0	7.0	5.6	4.3	2.9	2.2	1.7
4	14.9	16.8	15.0	12.0	9.9	8.0	6.4	5.2	4.1	2.9	2.1	1.6
5	4.5	9.5	10.2	9.3	8.2	7.0	5.8	4.8	3.8	2.7	2.1	1.6
6	1.0	4.8	6.3	6.8	6.5	5.9	5.1	4.4	3.5	2.6	2.0	1.6
7	.2	2.1	3.6	4.7	5.0	4.8	4.3	3.9	3.2	2.4	1.9	1.5
8	.0	.8	1.9	3.1	3.6	3.8	3.6	3.4	2.9	2.3	1.8	1.5
9	.0	.3	.9	1.9	2.5	2.9	3.0	2.9	2.6	2.1	1.7	1.4
10	.0	.1	.4	1.1	1.7	2.1	2.4	2.4	2.3	1.9	1.6	1.3
11	.0	.0	.2	.6	1.1	1.5	1.8	2.0	2.0	1.8	1.5	1.3
12	.0	.0	.1	.3	.7	1.1	1.4	1.6	1.7	1.6	1.4	1.2
13	.0	.0	.0	.2	.4	.7	1.0	1.3	1.4	1.4	1.3	1.1
14	.0	.0	.0	.1	.2	.5	.8	1.0	1.2	1.2	1.2	1.1
15	.0	.0	.0	.0	.1	.3	.5	.7	1.0	1.1	1.1	1.0
16	.0	.0	.0	.0	.1	.2	.4	.6	.8	.9	1.0	.9
17	.0	.0	.0	.0	.0	.1	.3	.4	.6	.8	.9	.8
18	.0	.0	.0	.0	.0	.1	.2	.3	.5	.7	.8	.8
19	.0	.0	.0	.0	.0	.0	.1	.2	.4	.6	.7	.7
20	.0	.0	.0	.0	.0	.0	.1	.1	.3	.5	.6	.6
21	.0	.0	.0	.0	.0	.0	.0	.1	.2	.4	.5	.6
22	.0	.0	.0	.0	.0	.0	.0	.1	.2	.3	.4	.5
23	.0	.0	.0	.0	.0	.0	.0	.0	.1	.3	.4	.5
24	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2	.3	.4
25	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2	.3	.4
26	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2	.3
27	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2	.3
28	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2	.2
29	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.2
30	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 6.6 POL = H
SUN INCIDENCE ANGLE = 49 TO 79 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S)											
	0	1	2	4	6	8	10	12	15	20	25	30
0	187.9	67.9	44.8	28.0	20.7	15.3	11.5	9.0	6.7	4.6	3.3	2.5
1	162.0	65.2	43.6	27.6	20.5	15.2	11.5	9.0	6.7	4.6	3.3	2.5
2	108.5	58.1	40.6	26.5	19.9	14.9	11.3	8.9	6.7	4.5	3.3	2.5
3	57.4	48.2	36.2	24.7	18.9	14.4	11.0	8.7	6.6	4.5	3.3	2.5
4	24.3	37.3	30.7	22.4	17.6	13.7	10.6	8.5	6.4	4.4	3.3	2.5
5	8.4	26.9	25.0	19.8	16.1	12.8	10.1	8.2	6.3	4.4	3.2	2.5
6	2.4	18.1	19.5	17.0	14.4	11.8	9.5	7.8	6.1	4.3	3.2	2.5
7	.6	11.4	14.5	14.2	12.7	10.8	8.9	7.4	5.8	4.2	3.1	2.4
8	.1	6.8	10.4	11.6	10.9	9.7	8.2	7.0	5.6	4.1	3.1	2.4
9	.0	3.8	7.1	9.2	9.2	8.5	7.5	6.5	5.3	3.9	3.0	2.4
10	.0	2.0	4.7	7.1	7.6	7.4	6.7	6.0	5.0	3.8	2.9	2.3
11	.0	1.0	2.9	5.3	6.2	6.4	6.0	5.5	4.7	3.6	2.8	2.3
12	.0	.4	1.8	3.9	4.9	5.4	5.3	5.0	4.4	3.4	2.7	2.2
13	.0	.2	1.0	2.8	3.9	4.5	4.6	4.5	4.0	3.3	2.6	2.2
14	.0	.1	.6	1.9	3.0	3.7	4.0	4.0	3.7	3.1	2.5	2.1
15	.0	.0	.3	1.3	2.2	3.0	3.4	3.5	3.4	2.9	2.4	2.0
16	.0	.0	.2	.9	1.6	2.4	2.9	3.1	3.1	2.7	2.3	2.0
17	.0	.0	.1	.6	1.2	1.9	2.4	2.7	2.8	2.6	2.2	1.9
18	.0	.0	.0	.4	.8	1.5	2.0	2.3	2.5	2.4	2.1	1.8
19	.0	.0	.0	.2	.6	1.1	1.6	2.0	2.2	2.2	2.0	1.7
20	.0	.0	.0	.1	.4	.8	1.3	1.7	2.0	2.0	1.9	1.7
21	.0	.0	.0	.1	.3	.6	1.1	1.4	1.7	1.8	1.8	1.6
22	.0	.0	.0	.0	.2	.5	.8	1.2	1.5	1.7	1.6	1.5
23	.0	.0	.0	.0	.1	.3	.7	1.0	1.3	1.5	1.5	1.4
24	.0	.0	.0	.0	.1	.2	.5	.8	1.1	1.4	1.4	1.4
25	.0	.0	.0	.0	.0	.2	.4	.6	1.0	1.2	1.3	1.3
26	.0	.0	.0	.0	.0	.1	.3	.5	.8	1.1	1.2	1.2
27	.0	.0	.0	.0	.0	.1	.2	.4	.7	1.0	1.1	1.1
28	.0	.0	.0	.0	.0	.1	.2	.3	.6	.9	1.0	1.1
29	.0	.0	.0	.0	.0	.0	.1	.3	.5	.8	.9	1.0
30	.0	.0	.0	.0	.0	.0	.1	.2	.4	.7	.9	.9

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 6.6 POL = H
SUN INCIDENCE ANGLE = 49 TO 29 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	187.9	67.9	44.8	28.0	20.7	15.3	11.5	9.0	6.7	4.6	3.3	2.5
1	166.7	65.7	43.8	27.6	20.5	15.2	11.4	9.0	6.7	4.5	3.3	2.5
2	111.3	59.0	40.9	26.5	19.8	14.9	11.2	8.9	6.6	4.5	3.3	2.5
3	55.1	49.0	36.4	24.7	18.8	14.3	10.9	8.6	6.5	4.4	3.3	2.5
4	19.9	37.6	30.9	22.4	17.5	13.5	10.5	8.4	6.3	4.4	3.2	2.5
5	5.2	26.7	25.0	19.7	16.0	12.6	9.9	8.0	6.1	4.3	3.2	2.4
6	.9	17.5	19.3	16.8	14.2	11.6	9.3	7.6	5.9	4.2	3.1	2.4
7	.1	10.6	14.1	14.0	12.4	10.5	8.7	7.2	5.7	4.0	3.0	2.4
8	.0	5.9	9.9	11.3	10.6	9.4	7.9	6.7	5.4	3.9	3.0	2.3
9	.0	3.0	6.5	8.8	8.9	8.2	7.2	6.3	5.1	3.7	2.9	2.3
10	.0	1.4	4.1	6.7	7.3	7.1	6.5	5.7	4.8	3.6	2.8	2.2
11	.0	.6	2.5	4.9	5.9	6.1	5.7	5.2	4.5	3.4	2.7	2.1
12	.0	.2	1.4	3.5	4.6	5.1	5.0	4.7	4.1	3.2	2.6	2.1
13	.0	.1	.8	2.5	3.5	4.2	4.4	4.2	3.8	3.1	2.5	2.0
14	.0	.0	.4	1.7	2.7	3.4	3.7	3.7	3.5	2.9	2.4	1.9
15	.0	.0	.2	1.1	2.0	2.7	3.2	3.3	3.1	2.7	2.3	1.9
16	.0	.0	.1	.7	1.4	2.1	2.6	2.8	2.8	2.5	2.1	1.8
17	.0	.0	.0	.4	1.0	1.7	2.2	2.5	2.5	2.3	2.0	1.7
18	.0	.0	.0	.2	.7	1.3	1.8	2.1	2.3	2.2	1.9	1.6
19	.0	.0	.0	.1	.5	.9	1.4	1.8	2.0	2.0	1.8	1.6
20	.0	.0	.0	.1	.3	.7	1.1	1.5	1.7	1.8	1.7	1.5
21	.0	.0	.0	.0	.2	.5	.9	1.2	1.5	1.6	1.6	1.4
22	.0	.0	.0	.0	.1	.4	.7	1.0	1.3	1.5	1.5	1.3
23	.0	.0	.0	.0	.1	.2	.5	.8	1.1	1.3	1.4	1.3
24	.0	.0	.0	.0	.0	.2	.4	.7	1.0	1.2	1.2	1.2
25	.0	.0	.0	.0	.0	.1	.3	.5	.8	1.1	1.1	1.1
26	.0	.0	.0	.0	.0	.1	.2	.4	.7	1.0	1.1	1.0
27	.0	.0	.0	.0	.0	.0	.2	.3	.6	.8	1.0	1.0
28	.0	.0	.0	.0	.0	.0	.1	.2	.5	.7	.9	.9
29	.0	.0	.0	.0	.0	.0	.1	.2	.4	.6	.8	.8
30	.0	.0	.0	.0	.0	.0	.1	.1	.3	.6	.7	.8

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 6.6 POL = H
SUN INCIDENCE ANGLE = CONSTANT 49 DEG. SUN AZIMUTH ANGLE = 0 TO 40.1 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	187.9	67.9	44.8	28.0	20.7	15.3	11.5	9.0	6.7	4.6	3.3	2.5
1	164.3	63.8	42.8	27.2	20.2	15.1	11.4	9.0	6.7	4.5	3.3	2.5
2	110.0	52.8	37.6	25.0	19.0	14.4	11.0	8.7	6.5	4.5	3.3	2.5
3	56.3	38.5	30.2	21.7	17.1	13.3	10.3	8.3	6.3	4.4	3.2	2.5
4	22.0	24.8	22.2	17.8	14.7	11.9	9.5	7.7	6.0	4.2	3.1	2.4
5	6.5	14.0	15.0	13.7	12.1	10.3	8.5	7.1	5.6	4.0	3.0	2.4
6	1.5	7.0	9.2	10.0	9.6	8.6	7.4	6.4	5.2	3.8	2.9	2.3
7	.3	3.1	5.2	6.9	7.2	7.0	6.3	5.6	4.7	3.6	2.8	2.2
8	.0	1.2	2.7	4.5	5.2	5.5	5.3	4.9	4.2	3.3	2.6	2.1
9	.0	.4	1.3	2.8	3.6	4.2	4.3	4.1	3.7	3.1	2.5	2.0
10	.0	.1	.6	1.6	2.4	3.1	3.4	3.4	3.3	2.8	2.3	1.9
11	.0	.0	.2	.9	1.5	2.2	2.6	2.8	2.8	2.5	2.1	1.8
12	.0	.0	.1	.5	.9	1.5	2.0	2.3	2.4	2.2	2.0	1.7
13	.0	.0	.0	.2	.6	1.0	1.5	1.8	2.0	2.0	1.8	1.6
14	.0	.0	.0	.1	.3	.7	1.1	1.4	1.6	1.7	1.6	1.5
15	.0	.0	.0	.0	.2	.4	.7	1.0	1.3	1.5	1.5	1.4
16	.0	.0	.0	.0	.1	.3	.5	.8	1.1	1.3	1.3	1.2
17	.0	.0	.0	.0	.0	.1	.3	.6	.8	1.1	1.2	1.1
18	.0	.0	.0	.0	.0	.1	.2	.4	.7	.9	1.0	1.0
19	.0	.0	.0	.0	.0	.0	.1	.3	.5	.8	.9	.9
20	.0	.0	.0	.0	.0	.0	.1	.2	.4	.6	.8	.8
21	.0	.0	.0	.0	.0	.0	.1	.1	.3	.5	.7	.7
22	.0	.0	.0	.0	.0	.0	.0	.1	.2	.4	.6	.7
23	.0	.0	.0	.0	.0	.0	.0	.1	.2	.3	.5	.6
24	.0	.0	.0	.0	.0	.0	.0	.0	.1	.3	.4	.5
25	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2	.4	.5
26	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2	.3	.4
27	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2	.3
28	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2	.3
29	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2	.3
30	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.2

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 10.7 POL = V
SUN INCIDENCE ANGLE = 49 TO 79 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	200.1	22.5	13.0	7.5	5.3	3.8	2.8	2.2	1.6	1.1	.8	.6
1	142.4	21.8	12.7	7.4	5.2	3.8	2.8	2.2	1.6	1.1	.8	.6
2	55.6	20.0	12.1	7.1	5.1	3.7	2.8	2.1	1.6	1.1	.8	.6
3	12.3	17.5	11.2	6.8	4.9	3.6	2.7	2.1	1.6	1.0	.8	.6
4	1.6	14.6	10.0	6.4	4.7	3.5	2.6	2.1	1.5	1.0	.8	.6
5	.1	11.6	8.8	5.9	4.4	3.3	2.5	2.0	1.5	1.0	.7	.6
6	.0	8.8	7.5	5.3	4.1	3.2	2.4	1.9	1.5	1.0	.7	.6
7	.0	6.3	6.2	4.8	3.8	3.0	2.3	1.9	1.4	1.0	.7	.6
8	.0	4.3	5.0	4.2	3.5	2.8	2.2	1.8	1.4	.9	.7	.5
9	.0	2.8	3.9	3.6	3.1	2.6	2.1	1.7	1.3	.9	.7	.5
10	.0	1.8	2.9	3.1	2.8	2.4	1.9	1.6	1.3	.9	.7	.5
11	.0	1.1	2.2	2.6	2.5	2.1	1.8	1.5	1.2	.9	.7	.5
12	.0	.6	1.6	2.1	2.1	1.9	1.7	1.4	1.2	.8	.6	.5
13	.0	.3	1.1	1.7	1.8	1.7	1.5	1.3	1.1	.8	.6	.5
14	.0	.2	.7	1.4	1.6	1.5	1.4	1.2	1.0	.8	.6	.5
15	.0	.1	.5	1.1	1.3	1.4	1.3	1.2	1.0	.7	.6	.5
16	.0	.0	.3	.8	1.1	1.2	1.1	1.1	.9	.7	.6	.4
17	.0	.0	.2	.6	.9	1.0	1.0	1.0	.9	.7	.5	.4
18	.0	.0	.1	.5	.7	.9	.9	.9	.8	.6	.5	.4
19	.0	.0	.1	.4	.6	.7	.8	.8	.7	.6	.5	.4
20	.0	.0	.0	.3	.5	.6	.7	.7	.7	.6	.5	.4
21	.0	.0	.0	.2	.4	.5	.6	.6	.6	.5	.5	.4
22	.0	.0	.0	.1	.3	.4	.5	.6	.6	.5	.4	.4
23	.0	.0	.0	.1	.2	.4	.5	.5	.5	.5	.4	.3
24	.0	.0	.0	.1	.2	.3	.4	.5	.5	.4	.4	.3
25	.0	.0	.0	.0	.1	.2	.3	.4	.4	.4	.4	.3
26	.0	.0	.0	.0	.1	.2	.3	.3	.4	.4	.3	.3
27	.0	.0	.0	.0	.1	.1	.2	.3	.3	.4	.3	.3
28	.0	.0	.0	.0	.0	.1	.2	.3	.3	.3	.3	.3
29	.0	.0	.0	.0	.0	.1	.2	.2	.3	.3	.3	.3
30	.0	.0	.0	.0	.0	.1	.1	.2	.2	.3	.3	.2

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 10.7 POL = V
SUN INCIDENCE ANGLE = 49 TO 29 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	200.1	22.5	13.0	7.5	5.3	3.8	2.8	2.2	1.6	1.1	.8	.6
1	148.5	22.2	12.9	7.5	5.3	3.9	2.8	2.2	1.6	1.1	.8	.6
2	56.1	20.8	12.5	7.4	5.3	3.8	2.8	2.2	1.6	1.1	.8	.6
3	10.4	18.5	11.8	7.1	5.2	3.8	2.8	2.2	1.6	1.1	.8	.6
4	.9	15.7	10.8	6.8	5.0	3.7	2.8	2.2	1.6	1.1	.8	.6
5	.0	12.7	9.6	6.4	4.8	3.6	2.7	2.2	1.6	1.1	.8	.6
6	.0	9.7	8.2	5.9	4.5	3.5	2.7	2.1	1.6	1.1	.8	.6
7	.0	7.1	6.9	5.3	4.3	3.3	2.6	2.1	1.6	1.1	.8	.6
8	.0	4.9	5.6	4.8	3.9	3.1	2.5	2.0	1.5	1.1	.8	.6
9	.0	3.2	4.5	4.2	3.6	3.0	2.4	1.9	1.5	1.1	.8	.6
10	.0	2.0	3.4	3.6	3.3	2.8	2.3	1.9	1.5	1.0	.8	.6
11	.0	1.2	2.6	3.1	2.9	2.5	2.1	1.8	1.4	1.0	.8	.6
12	.0	.7	1.9	2.6	2.6	2.3	2.0	1.7	1.4	1.0	.8	.6
13	.0	.4	1.3	2.1	2.2	2.1	1.9	1.6	1.3	1.0	.8	.6
14	.0	.2	.9	1.7	1.9	1.9	1.7	1.5	1.3	1.0	.7	.6
15	.0	.1	.6	1.4	1.7	1.7	1.6	1.5	1.2	.9	.7	.6
16	.0	.0	.4	1.1	1.4	1.5	1.5	1.4	1.2	.9	.7	.6
17	.0	.0	.2	.8	1.2	1.3	1.3	1.3	1.1	.9	.7	.6
18	.0	.0	.1	.6	1.0	1.2	1.2	1.2	1.1	.9	.7	.6
19	.0	.0	.1	.5	.8	1.0	1.1	1.1	1.0	.8	.7	.5
20	.0	.0	.0	.3	.6	.9	1.0	1.0	.9	.8	.7	.5
21	.0	.0	.0	.2	.5	.7	.9	.9	.9	.8	.6	.5
22	.0	.0	.0	.2	.4	.6	.8	.8	.8	.7	.6	.5
23	.0	.0	.0	.1	.3	.5	.7	.7	.8	.7	.6	.5
24	.0	.0	.0	.1	.2	.4	.6	.7	.7	.7	.6	.5
25	.0	.0	.0	.1	.2	.3	.5	.6	.7	.6	.6	.5
26	.0	.0	.0	.0	.1	.3	.4	.5	.6	.6	.5	.5
27	.0	.0	.0	.0	.1	.2	.4	.5	.5	.6	.5	.5
28	.0	.0	.0	.0	.1	.2	.3	.4	.5	.5	.5	.4
29	.0	.0	.0	.0	.0	.1	.3	.4	.5	.5	.5	.4
30	.0	.0	.0	.0	.0	.1	.2	.3	.4	.5	.5	.4

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 10.7 POL = V
SUN INCIDENCE ANGLE = CONSTANT 49 DEG. SUN AZIMUTH ANGLE = 0 TO 40.1 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	200.1	22.5	13.0	7.5	5.3	3.8	2.8	2.2	1.6	1.1	.8	.6
1	145.6	21.4	12.6	7.3	5.3	3.8	2.8	2.2	1.6	1.1	.8	.6
2	56.0	18.3	11.5	7.0	5.1	3.7	2.8	2.2	1.6	1.1	.8	.6
3	11.4	14.2	9.9	6.4	4.8	3.5	2.7	2.1	1.6	1.1	.8	.6
4	1.2	9.9	8.0	5.7	4.4	3.3	2.6	2.0	1.5	1.0	.8	.6
5	.1	6.2	6.1	4.8	3.9	3.1	2.4	1.9	1.5	1.0	.8	.6
6	.0	3.5	4.4	4.0	3.4	2.8	2.2	1.8	1.4	1.0	.7	.6
7	.0	1.8	3.0	3.2	2.9	2.5	2.1	1.7	1.4	1.0	.7	.6
8	.0	.8	1.9	2.5	2.4	2.2	1.9	1.6	1.3	.9	.7	.6
9	.0	.3	1.1	1.8	2.0	1.9	1.7	1.5	1.2	.9	.7	.6
10	.0	.1	.6	1.3	1.6	1.6	1.5	1.3	1.1	.9	.7	.5
11	.0	.0	.3	.9	1.2	1.3	1.3	1.2	1.1	.8	.7	.5
12	.0	.0	.2	.6	.9	1.1	1.1	1.1	1.0	.8	.6	.5
13	.0	.0	.1	.4	.7	.9	1.0	1.0	.9	.7	.6	.5
14	.0	.0	.0	.2	.5	.7	.8	.8	.8	.7	.6	.5
15	.0	.0	.0	.2	.3	.5	.7	.7	.7	.7	.6	.5
16	.0	.0	.0	.1	.2	.4	.6	.6	.7	.6	.5	.5
17	.0	.0	.0	.0	.2	.3	.4	.5	.6	.6	.5	.4
18	.0	.0	.0	.0	.1	.2	.4	.5	.5	.5	.5	.4
19	.0	.0	.0	.0	.1	.2	.3	.4	.5	.5	.5	.4
20	.0	.0	.0	.0	.0	.1	.2	.3	.4	.4	.4	.4
21	.0	.0	.0	.0	.0	.1	.2	.3	.3	.4	.4	.4
22	.0	.0	.0	.0	.0	.1	.1	.2	.3	.4	.4	.4
23	.0	.0	.0	.0	.0	.0	.1	.2	.3	.3	.4	.3
24	.0	.0	.0	.0	.0	.0	.1	.1	.2	.3	.3	.3
25	.0	.0	.0	.0	.0	.0	.1	.1	.2	.3	.3	.3
26	.0	.0	.0	.0	.0	.0	.0	.1	.2	.2	.3	.3
27	.0	.0	.0	.0	.0	.0	.0	.1	.1	.2	.3	.3
28	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2	.2	.3
29	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2	.2	.2
30	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 10.7 POL = H
SUN INCIDENCE ANGLE = 49 TO 79 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	301.3	33.9	19.6	11.3	8.0	5.8	4.3	3.3	2.4	1.6	1.2	.9
1	216.8	33.1	19.4	11.2	8.0	5.8	4.3	3.3	2.4	1.6	1.2	.9
2	85.5	30.8	18.6	11.0	7.9	5.7	4.2	3.3	2.4	1.6	1.2	.9
3	19.2	27.3	17.4	10.6	7.7	5.6	4.2	3.3	2.4	1.6	1.2	.9
4	2.5	23.0	15.8	10.0	7.4	5.5	4.1	3.2	2.4	1.6	1.2	.9
5	.2	18.5	14.0	9.4	7.1	5.3	4.0	3.2	2.4	1.6	1.2	.9
6	.0	14.1	12.0	8.6	6.7	5.1	3.9	3.1	2.3	1.6	1.2	.9
7	.0	10.3	10.1	7.8	6.2	4.9	3.8	3.0	2.3	1.6	1.2	.9
8	.0	7.2	8.2	6.9	5.7	4.6	3.6	2.9	2.2	1.6	1.2	.9
9	.0	4.7	6.5	6.1	5.2	4.3	3.5	2.8	2.2	1.5	1.1	.9
10	.0	3.0	5.0	5.3	4.7	4.0	3.3	2.7	2.1	1.5	1.1	.9
11	.0	1.8	3.7	4.5	4.2	3.7	3.1	2.6	2.1	1.5	1.1	.9
12	.0	1.0	2.7	3.7	3.7	3.4	2.9	2.5	2.0	1.5	1.1	.9
13	.0	.6	1.9	3.1	3.2	3.1	2.7	2.4	1.9	1.4	1.1	.9
14	.0	.3	1.3	2.5	2.8	2.8	2.5	2.2	1.8	1.4	1.1	.8
15	.0	.1	.9	2.0	2.4	2.5	2.3	2.1	1.8	1.3	1.1	.8
16	.0	.1	.6	1.6	2.0	2.2	2.1	2.0	1.7	1.3	1.0	.8
17	.0	.0	.4	1.2	1.7	1.9	1.9	1.8	1.6	1.3	1.0	.8
18	.0	.0	.2	.9	1.4	1.7	1.7	1.7	1.5	1.2	1.0	.8
19	.0	.0	.1	.7	1.1	1.4	1.6	1.6	1.4	1.2	1.0	.8
20	.0	.0	.1	.5	.9	1.2	1.4	1.4	1.3	1.1	.9	.8
21	.0	.0	.0	.4	.7	1.0	1.2	1.3	1.3	1.1	.9	.8
22	.0	.0	.0	.3	.6	.9	1.1	1.2	1.2	1.0	.9	.7
23	.0	.0	.0	.2	.4	.7	1.0	1.1	1.1	1.0	.9	.7
24	.0	.0	.0	.1	.3	.6	.8	1.0	1.0	.9	.8	.7
25	.0	.0	.0	.1	.3	.5	.7	.9	.9	.9	.8	.7
26	.0	.0	.0	.1	.2	.4	.6	.8	.9	.8	.8	.7
27	.0	.0	.0	.0	.1	.3	.5	.7	.8	.8	.7	.7
28	.0	.0	.0	.0	.1	.3	.4	.6	.7	.8	.7	.6
29	.0	.0	.0	.0	.1	.2	.4	.5	.7	.7	.7	.6
30	.0	.0	.0	.0	.1	.2	.3	.5	.6	.7	.6	.6

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 10.7 POL = H
SUN INCIDENCE ANGLE = 49 TO 29 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	301.3	33.9	19.6	11.3	8.0	5.8	4.3	3.3	2.4	1.6	1.2	.9
1	221.4	33.1	19.3	11.1	7.9	5.7	4.2	3.3	2.4	1.6	1.2	.9
2	82.8	30.7	18.5	10.9	7.8	5.7	4.2	3.3	2.4	1.6	1.2	.9
3	15.2	27.1	17.2	10.4	7.6	5.5	4.1	3.2	2.4	1.6	1.2	.9
4	1.3	22.7	15.6	9.8	7.3	5.4	4.0	3.2	2.3	1.6	1.2	.9
5	.1	18.2	13.7	9.1	6.9	5.2	3.9	3.1	2.3	1.6	1.1	.9
6	.0	13.8	11.7	8.4	6.5	4.9	3.8	3.0	2.3	1.5	1.1	.9
7	.0	9.9	9.7	7.5	6.0	4.7	3.6	2.9	2.2	1.5	1.1	.9
8	.0	6.8	7.9	6.7	5.5	4.4	3.5	2.8	2.1	1.5	1.1	.9
9	.0	4.4	6.2	5.8	5.0	4.1	3.3	2.7	2.1	1.5	1.1	.8
10	.0	2.7	4.7	5.0	4.5	3.8	3.1	2.6	2.0	1.4	1.1	.8
11	.0	1.6	3.5	4.2	4.0	3.5	2.9	2.4	1.9	1.4	1.1	.8
12	.0	.9	2.5	3.5	3.5	3.2	2.7	2.3	1.9	1.4	1.0	.8
13	.0	.5	1.8	2.8	3.0	2.8	2.5	2.2	1.8	1.3	1.0	.8
14	.0	.2	1.2	2.3	2.6	2.5	2.3	2.0	1.7	1.3	1.0	.8
15	.0	.1	.8	1.8	2.2	2.3	2.1	1.9	1.6	1.2	1.0	.8
16	.0	.0	.5	1.4	1.8	2.0	1.9	1.8	1.5	1.2	.9	.8
17	.0	.0	.3	1.1	1.5	1.7	1.7	1.6	1.4	1.1	.9	.7
18	.0	.0	.2	.8	1.2	1.5	1.6	1.5	1.4	1.1	.9	.7
19	.0	.0	.1	.6	1.0	1.3	1.4	1.4	1.3	1.1	.9	.7
20	.0	.0	.1	.4	.8	1.1	1.2	1.3	1.2	1.0	.8	.7
21	.0	.0	.0	.3	.6	.9	1.1	1.1	1.1	1.0	.8	.7
22	.0	.0	.0	.2	.5	.8	1.0	1.0	1.0	.9	.8	.6
23	.0	.0	.0	.1	.4	.6	.8	.9	1.0	.9	.7	.6
24	.0	.0	.0	.1	.3	.5	.7	.8	.9	.8	.7	.6
25	.0	.0	.0	.1	.2	.4	.6	.7	.8	.8	.7	.6
26	.0	.0	.0	.0	.2	.3	.5	.6	.7	.7	.7	.6
27	.0	.0	.0	.0	.1	.3	.4	.6	.7	.7	.6	.6
28	.0	.0	.0	.0	.1	.2	.4	.5	.6	.6	.6	.5
29	.0	.0	.0	.0	.1	.2	.3	.4	.5	.6	.6	.5
30	.0	.0	.0	.0	.0	.1	.3	.4	.5	.6	.5	.5

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 10.7 POL = H
SUN INCIDENCE ANGLE = CONSTANT 49 DEG. SUN AZIMUTH ANGLE = 0 TO 40.1 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S)											
	0	1	2	4	6	8	10	12	15	20	25	30
0	301.3	33.9	19.6	11.3	8.0	5.8	4.3	3.3	2.4	1.6	1.2	.9
1	219.1	32.2	19.0	11.1	7.9	5.7	4.2	3.3	2.4	1.6	1.2	.9
2	84.2	27.6	17.3	10.5	7.6	5.6	4.1	3.2	2.4	1.6	1.2	.9
3	17.1	21.2	14.9	9.6	7.1	5.3	4.0	3.2	2.4	1.6	1.2	.9
4	1.8	14.8	12.0	8.5	6.5	5.0	3.8	3.0	2.3	1.6	1.2	.9
5	.1	9.3	9.1	7.2	5.8	4.6	3.6	2.9	2.2	1.5	1.1	.9
6	.0	5.2	6.5	5.9	5.1	4.2	3.3	2.7	2.1	1.5	1.1	.9
7	.0	2.7	4.4	4.7	4.3	3.7	3.1	2.6	2.0	1.4	1.1	.8
8	.0	1.2	2.8	3.6	3.6	3.2	2.8	2.4	1.9	1.4	1.1	.8
9	.0	.5	1.6	2.7	2.9	2.8	2.5	2.2	1.8	1.3	1.0	.8
10	.0	.2	.9	1.9	2.3	2.3	2.2	2.0	1.7	1.3	1.0	.8
11	.0	.1	.5	1.3	1.7	1.9	1.9	1.8	1.5	1.2	1.0	.8
12	.0	.0	.2	.9	1.3	1.5	1.6	1.6	1.4	1.1	.9	.7
13	.0	.0	.1	.6	.9	1.2	1.4	1.4	1.3	1.1	.9	.7
14	.0	.0	.0	.4	.7	1.0	1.1	1.2	1.2	1.0	.8	.7
15	.0	.0	.0	.2	.5	.7	.9	1.0	1.0	.9	.8	.7
16	.0	.0	.0	.1	.3	.5	.8	.9	.9	.9	.7	.6
17	.0	.0	.0	.1	.2	.4	.6	.7	.8	.8	.7	.6
18	.0	.0	.0	.0	.1	.3	.5	.6	.7	.7	.7	.6
19	.0	.0	.0	.0	.1	.2	.4	.5	.6	.7	.6	.6
20	.0	.0	.0	.0	.1	.2	.3	.4	.5	.6	.6	.5
21	.0	.0	.0	.0	.0	.1	.2	.3	.5	.5	.5	.5
22	.0	.0	.0	.0	.0	.1	.2	.3	.4	.5	.5	.5
23	.0	.0	.0	.0	.0	.0	.1	.2	.3	.4	.5	.4
24	.0	.0	.0	.0	.0	.0	.1	.2	.3	.4	.4	.4
25	.0	.0	.0	.0	.0	.0	.1	.1	.2	.3	.4	.4
26	.0	.0	.0	.0	.0	.0	.0	.1	.2	.3	.3	.4
27	.0	.0	.0	.0	.0	.0	.0	.1	.2	.3	.3	.3
28	.0	.0	.0	.0	.0	.0	.0	.1	.1	.2	.3	.3
29	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2	.3	.3
30	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2	.2	.3

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 18.0 POL = V
SUN INCIDENCE ANGLE = 49 TO 79 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	353.7	14.6	8.1	4.6	3.2	2.3	1.7	1.3	1.0	.6	.5	.4
1	155.0	14.1	7.9	4.5	3.2	2.3	1.7	1.3	1.0	.6	.5	.3
2	14.6	13.1	7.6	4.4	3.1	2.2	1.6	1.3	.9	.6	.5	.3
3	.3	11.6	7.1	4.2	3.0	2.2	1.6	1.3	.9	.6	.4	.3
4	.0	9.8	6.4	4.0	2.9	2.1	1.6	1.2	.9	.6	.4	.3
5	.0	8.0	5.7	3.7	2.7	2.0	1.5	1.2	.9	.6	.4	.3
6	.0	6.2	4.9	3.4	2.6	1.9	1.5	1.2	.9	.6	.4	.3
7	.0	4.6	4.2	3.1	2.4	1.8	1.4	1.1	.8	.6	.4	.3
8	.0	3.2	3.4	2.7	2.2	1.7	1.3	1.1	.8	.6	.4	.3
9	.0	2.2	2.8	2.4	2.0	1.6	1.3	1.0	.8	.6	.4	.3
10	.0	1.4	2.2	2.1	1.8	1.5	1.2	1.0	.8	.5	.4	.3
11	.0	.9	1.6	1.8	1.6	1.4	1.1	.9	.7	.5	.4	.3
12	.0	.5	1.2	1.5	1.4	1.3	1.1	.9	.7	.5	.4	.3
13	.0	.3	.9	1.3	1.3	1.1	1.0	.8	.7	.5	.4	.3
14	.0	.2	.6	1.0	1.1	1.0	.9	.8	.6	.5	.4	.3
15	.0	.1	.4	.8	.9	.9	.8	.7	.6	.5	.3	.3
16	.0	.0	.3	.7	.8	.8	.8	.7	.6	.4	.3	.3
17	.0	.0	.2	.5	.7	.7	.7	.6	.5	.4	.3	.3
18	.0	.0	.1	.4	.6	.6	.6	.6	.5	.4	.3	.3
19	.0	.0	.1	.3	.5	.5	.6	.5	.5	.4	.3	.2
20	.0	.0	.0	.2	.4	.5	.5	.5	.4	.4	.3	.2
21	.0	.0	.0	.2	.3	.4	.4	.4	.4	.3	.3	.2
22	.0	.0	.0	.1	.2	.3	.4	.4	.4	.3	.3	.2
23	.0	.0	.0	.1	.2	.3	.3	.4	.4	.3	.3	.2
24	.0	.0	.0	.1	.1	.2	.3	.3	.3	.3	.2	.2
25	.0	.0	.0	.0	.1	.2	.3	.3	.3	.3	.2	.2
26	.0	.0	.0	.0	.1	.2	.2	.3	.3	.3	.2	.2
27	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2	.2	.2
28	.0	.0	.0	.0	.0	.1	.2	.2	.2	.2	.2	.2
29	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2	.2
30	.0	.0	.0	.0	.0	.1	.1	.1	.2	.2	.2	.2

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 18.0 POL = V
SUN INCIDENCE ANGLE = 49 TO 29 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	353.7	14.6	8.1	4.6	3.2	2.3	1.7	1.3	1.0	.6	.5	.4
1	158.8	14.4	8.1	4.6	3.2	2.3	1.7	1.3	1.0	.6	.5	.4
2	12.9	13.5	7.8	4.5	3.2	2.3	1.7	1.3	1.0	.6	.5	.4
3	.2	12.2	7.4	4.4	3.2	2.3	1.7	1.3	1.0	.7	.5	.4
4	.0	10.5	6.9	4.2	3.1	2.3	1.7	1.3	1.0	.7	.5	.4
5	.0	8.7	6.2	4.0	3.0	2.2	1.7	1.3	1.0	.7	.5	.4
6	.0	6.8	5.5	3.7	2.8	2.1	1.6	1.3	1.0	.6	.5	.4
7	.0	5.1	4.7	3.4	2.7	2.1	1.6	1.3	.9	.6	.5	.4
8	.0	3.7	3.9	3.1	2.5	2.0	1.5	1.2	.9	.6	.5	.4
9	.0	2.5	3.2	2.8	2.3	1.9	1.5	1.2	.9	.6	.5	.4
10	.0	1.7	2.5	2.5	2.1	1.8	1.4	1.2	.9	.6	.5	.4
11	.0	1.0	2.0	2.1	1.9	1.6	1.4	1.1	.9	.6	.5	.4
12	.0	.6	1.5	1.8	1.7	1.5	1.3	1.1	.9	.6	.5	.4
13	.0	.4	1.1	1.6	1.6	1.4	1.2	1.0	.8	.6	.5	.4
14	.0	.2	.8	1.3	1.4	1.3	1.1	1.0	.8	.6	.4	.4
15	.0	.1	.5	1.1	1.2	1.2	1.1	.9	.8	.6	.4	.3
16	.0	.0	.4	.9	1.0	1.1	1.0	.9	.7	.6	.4	.3
17	.0	.0	.2	.7	.9	.9	.9	.8	.7	.6	.4	.3
18	.0	.0	.2	.5	.7	.8	.8	.8	.7	.5	.4	.3
19	.0	.0	.1	.4	.6	.7	.8	.7	.7	.5	.4	.3
20	.0	.0	.1	.3	.5	.6	.7	.7	.6	.5	.4	.3
21	.0	.0	.0	.2	.4	.6	.6	.6	.6	.5	.4	.3
22	.0	.0	.0	.2	.3	.5	.6	.6	.6	.5	.4	.3
23	.0	.0	.0	.1	.3	.4	.5	.5	.5	.5	.4	.3
24	.0	.0	.0	.1	.2	.4	.4	.5	.5	.4	.4	.3
25	0.	.0	.0	.1	.2	.3	.4	.4	.5	.4	.4	.3
26	0.	.0	.0	.0	.1	.2	.3	.4	.4	.4	.3	.3
27	0.	.0	.0	.0	.1	.2	.3	.4	.4	.4	.3	.3
28	0.	.0	.0	.0	.1	.2	.3	.3	.4	.4	.3	.3
29	0.	.0	.0	.0	.1	.1	.2	.3	.3	.3	.3	.3
30	0.	.0	.0	.0	.0	.1	.2	.3	.3	.3	.3	.3

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 18.0 POL = V
SUN INCIDENCE ANGLE = CONSTANT 49 DEG. SUN AZIMUTH ANGLE = 0 TO 40.1 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	353.7	14.6	8.1	4.6	3.2	2.3	1.7	1.3	1.0	.6	.5	.4
1	157.0	13.9	7.9	4.5	3.2	2.3	1.7	1.3	1.0	.6	.5	.4
2	13.7	11.9	7.3	4.3	3.1	2.2	1.7	1.3	1.0	.6	.5	.4
3	.2	9.3	6.3	4.0	2.9	2.2	1.6	1.3	.9	.6	.5	.3
4	.0	6.6	5.2	3.6	2.7	2.0	1.6	1.2	.9	.6	.5	.3
5	.0	4.2	4.1	3.1	2.5	1.9	1.5	1.2	.9	.6	.4	.3
6	.0	2.4	3.0	2.6	2.2	1.8	1.4	1.1	.9	.6	.4	.3
7	.0	1.3	2.1	2.1	1.9	1.6	1.3	1.1	.8	.6	.4	.3
8	.0	.6	1.4	1.7	1.6	1.4	1.2	1.0	.8	.6	.4	.3
9	.0	.3	.9	1.3	1.3	1.2	1.1	.9	.8	.6	.4	.3
10	.0	.1	.5	1.0	1.1	1.1	1.0	.9	.7	.5	.4	.3
11	.0	.0	.3	.7	.9	.9	.9	.8	.7	.5	.4	.3
12	.0	.0	.2	.5	.7	.8	.8	.7	.6	.5	.4	.3
13	.0	.0	.1	.3	.5	.6	.7	.7	.6	.5	.4	.3
14	.0	.0	.0	.2	.4	.5	.6	.6	.5	.4	.4	.3
15	.0	.0	.0	.1	.3	.4	.5	.5	.5	.4	.4	.3
16	.0	.0	.0	.1	.2	.3	.4	.5	.5	.4	.3	.3
17	.0	.0	.0	.1	.1	.3	.3	.4	.4	.4	.3	.3
18	.0	.0	.0	.0	.1	.2	.3	.3	.4	.4	.3	.3
19	.0	.0	.0	.0	.1	.1	.2	.3	.3	.3	.3	.3
20	.0	.0	.0	.0	.0	.1	.2	.2	.3	.3	.3	.3
21	.0	.0	.0	.0	.0	.1	.2	.2	.3	.3	.3	.2
22	.0	.0	.0	.0	.0	.1	.1	.2	.2	.3	.3	.2
23	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2
24	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2
25	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2
26	.0	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2
27	.0	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2
28	0.	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2
29	0.	.0	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2
30	0.	.0	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 18.0 POL = H
SUN INCIDENCE ANGLE = 49 TO 79 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	549.9	22.6	12.6	7.1	5.0	3.6	2.6	2.0	1.5	1.0	.7	.5
1	243.7	22.2	12.5	7.1	5.0	3.6	2.6	2.0	1.5	1.0	.7	.5
2	23.2	20.8	12.1	6.9	4.9	3.6	2.6	2.0	1.5	1.0	.7	.5
3	.5	18.7	11.4	6.7	4.8	3.5	2.6	2.0	1.5	1.0	.7	.5
4	.0	16.0	10.5	6.4	4.7	3.4	2.6	2.0	1.5	1.0	.7	.6
5	.0	13.1	9.4	6.1	4.5	3.4	2.5	2.0	1.5	1.0	.7	.5
6	.0	10.3	8.3	5.6	4.3	3.2	2.5	1.9	1.5	1.0	.7	.5
7	.0	7.7	7.1	5.2	4.0	3.1	2.4	1.9	1.4	1.0	.7	.5
8	.0	5.6	5.9	4.7	3.8	3.0	2.3	1.9	1.4	1.0	.7	.5
9	.0	3.8	4.8	4.2	3.5	2.8	2.2	1.8	1.4	1.0	.7	.5
10	.0	2.5	3.8	3.7	3.2	2.6	2.1	1.7	1.3	.9	.7	.5
11	.0	1.6	2.9	3.2	2.9	2.5	2.0	1.7	1.3	.9	.7	.5
12	.0	.9	2.2	2.7	2.6	2.3	1.9	1.6	1.3	.9	.7	.5
13	.0	.5	1.6	2.3	2.3	2.1	1.8	1.5	1.2	.9	.7	.5
14	.0	.3	1.2	1.9	2.0	1.9	1.7	1.5	1.2	.9	.7	.5
15	.0	.2	.8	1.6	1.8	1.7	1.6	1.4	1.2	.9	.7	.5
16	.0	.1	.6	1.3	1.5	1.6	1.5	1.3	1.1	.8	.6	.5
17	.0	.0	.4	1.0	1.3	1.4	1.4	1.2	1.1	.8	.6	.5
18	.0	.0	.2	.8	1.1	1.2	1.2	1.2	1.0	.8	.6	.5
19	.0	.0	.2	.6	.9	1.1	1.1	1.1	1.0	.8	.6	.5
20	.0	.0	.1	.5	.8	1.0	1.0	1.0	.9	.7	.6	.5
21	.0	.0	.1	.4	.6	.8	.9	.9	.9	.7	.6	.5
22	.0	.0	.0	.3	.5	.7	.8	.9	.8	.7	.6	.5
23	.0	.0	.0	.2	.4	.6	.7	.8	.8	.7	.6	.5
24	.0	.0	.0	.1	.3	.5	.7	.7	.7	.6	.5	.5
25	.0	.0	.0	.1	.3	.4	.6	.7	.7	.6	.5	.4
26	.0	.0	.0	.1	.2	.4	.5	.6	.6	.6	.5	.4
27	.0	.0	.0	.0	.1	.3	.4	.5	.6	.6	.5	.4
28	.0	.0	.0	.0	.1	.2	.4	.5	.5	.5	.5	.4
29	.0	.0	.0	.0	.1	.2	.3	.4	.5	.5	.5	.4
30	.0	.0	.0	.0	.1	.2	.3	.4	.5	.5	.4	.4

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 18.0 POL = H
SUN INCIDENCE ANGLE = 49 TO 29 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	549.9	22.6	12.6	7.1	5.0	3.6	2.6	2.0	1.5	1.0	.7	.5
1	244.2	22.1	12.4	7.0	5.0	3.6	2.6	2.0	1.5	1.0	.7	.5
2	19.6	20.6	11.9	6.9	4.9	3.5	2.6	2.0	1.5	1.0	.7	.5
3	.3	18.4	11.2	6.6	4.7	3.5	2.5	2.0	1.5	1.0	.7	.5
4	.0	15.7	10.2	6.3	4.6	3.4	2.5	2.0	1.4	1.0	.7	.5
5	.0	12.8	9.1	5.9	4.4	3.2	2.4	1.9	1.4	1.0	.7	.5
6	.0	10.0	8.0	5.4	4.1	3.1	2.4	1.9	1.4	.9	.7	.5
7	.0	7.4	6.8	5.0	3.9	3.0	2.3	1.8	1.4	.9	.7	.5
8	.0	5.3	5.6	4.5	3.6	2.8	2.2	1.8	1.3	.9	.7	.5
9	.0	3.6	4.5	4.0	3.3	2.6	2.1	1.7	1.3	.9	.7	.5
10	.0	2.3	3.6	3.5	3.0	2.5	2.0	1.6	1.3	.9	.7	.5
11	.0	1.4	2.7	3.0	2.7	2.3	1.9	1.6	1.2	.9	.6	.5
12	.0	.9	2.0	2.5	2.4	2.1	1.8	1.5	1.2	.8	.6	.5
13	.0	.5	1.5	2.1	2.1	1.9	1.7	1.4	1.1	.8	.6	.5
14	.0	.3	1.1	1.8	1.9	1.8	1.5	1.3	1.1	.8	.6	.5
15	.0	.1	.7	1.4	1.6	1.6	1.4	1.3	1.0	.8	.6	.5
16	.0	.1	.5	1.1	1.4	1.4	1.3	1.2	1.0	.8	.6	.5
17	.0	.0	.3	.9	1.2	1.3	1.2	1.1	.9	.7	.6	.5
18	.0	.0	.2	.7	1.0	1.1	1.1	1.0	.9	.7	.6	.4
19	.0	.0	.1	.5	.8	1.0	1.0	1.0	.9	.7	.5	.4
20	.0	.0	.1	.4	.7	.8	.9	.9	.8	.7	.5	.4
21	.0	.0	.0	.3	.5	.7	.8	.8	.8	.6	.5	.4
22	.0	.0	.0	.2	.4	.6	.7	.7	.7	.6	.5	.4
23	.0	.0	.0	.2	.3	.5	.6	.7	.7	.6	.5	.4
24	.0	.0	.0	.1	.3	.4	.6	.6	.6	.5	.5	.4
25	0.	.0	.0	.1	.2	.4	.5	.6	.6	.5	.4	.4
26	0.	.0	.0	.1	.2	.3	.4	.5	.5	.5	.4	.4
27	0.	.0	.0	.0	.1	.3	.4	.4	.5	.5	.4	.4
28	0.	.0	.0	.0	.1	.2	.3	.4	.4	.4	.4	.3
29	0.	.0	.0	.0	.1	.2	.3	.4	.4	.4	.4	.3
30	0.	.0	.0	.0	.0	.1	.2	.3	.4	.4	.4	.3

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 18.0 POL = H
SUN INCIDENCE ANGLE = CONSTANT 49 DEG. SUN AZIMUTH ANGLE = 0 TO 40.1 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	549.9	22.6	12.6	7.1	5.0	3.6	2.6	2.0	1.5	1.0	.7	.5
1	244.0	21.5	12.3	7.0	4.9	3.6	2.6	2.0	1.5	1.0	.7	.5
2	21.3	18.5	11.3	6.7	4.8	3.5	2.6	2.0	1.5	1.0	.7	.5
3	.4	14.4	9.8	6.2	4.5	3.3	2.5	2.0	1.5	1.0	.7	.5
4	.0	10.2	8.1	5.5	4.2	3.2	2.4	1.9	1.4	1.0	.7	.5
5	.0	6.5	6.3	4.8	3.8	2.9	2.3	1.8	1.4	.9	.7	.5
6	.0	3.7	4.6	4.0	3.3	2.7	2.1	1.7	1.3	.9	.7	.5
7	.0	2.0	3.2	3.3	2.9	2.4	2.0	1.6	1.3	.9	.7	.5
8	.0	.9	2.1	2.6	2.5	2.2	1.8	1.5	1.2	.9	.7	.5
9	.0	.4	1.3	2.0	2.0	1.9	1.6	1.4	1.1	.8	.6	.5
10	.0	.2	.8	1.5	1.6	1.6	1.5	1.3	1.1	.8	.6	.5
11	.0	.1	.4	1.1	1.3	1.4	1.3	1.2	1.0	.8	.6	.5
12	.0	.0	.2	.7	1.0	1.1	1.1	1.1	.9	.7	.6	.5
13	.0	.0	.1	.5	.8	.9	1.0	1.0	.9	.7	.6	.4
14	.0	.0	.1	.3	.6	.8	.8	.8	.8	.7	.5	.4
15	.0	.0	.0	.2	.4	.6	.7	.7	.7	.6	.5	.4
16	.0	.0	.0	.1	.3	.5	.6	.6	.6	.6	.5	.4
17	.0	.0	.0	.1	.2	.4	.5	.6	.6	.5	.5	.4
18	.0	.0	.0	.0	.1	.3	.4	.5	.5	.5	.4	.4
19	.0	.0	.0	.0	.1	.2	.3	.4	.5	.5	.4	.4
20	.0	.0	.0	.0	.1	.2	.3	.3	.4	.4	.4	.3
21	.0	.0	.0	.0	.0	.1	.2	.3	.4	.4	.4	.3
22	.0	.0	.0	.0	.0	.1	.2	.2	.3	.4	.3	.3
23	.0	.0	.0	.0	.0	.1	.1	.2	.3	.3	.3	.3
24	.0	.0	.0	.0	.0	.0	.1	.2	.2	.3	.3	.3
25	.0	.0	.0	.0	.0	.0	.1	.1	.2	.3	.3	.3
26	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2	.3	.3
27	.0	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2
28	0.	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2
29	0.	.0	.0	.0	.0	.0	.0	.0	.1	.2	.2	.2
30	0.	.0	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 21.0 POL = V
SUN INCIDENCE ANGLE = 49 TO 79 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S)											
	0	1	2	4	6	8	10	12	15	20	25	30
0	441.6	11.6	6.4	3.6	2.5	1.8	1.3	1.0	.8	.5	.4	.3
1	139.5	11.3	6.3	3.5	2.5	1.8	1.3	1.0	.7	.5	.4	.3
2	5.0	10.5	6.0	3.4	2.4	1.8	1.3	1.0	.7	.5	.4	.3
3	.0	9.4	5.7	3.3	2.4	1.7	1.3	1.0	.7	.5	.4	.3
4	.0	8.1	5.2	3.1	2.3	1.7	1.2	1.0	.7	.5	.3	.3
5	.0	6.7	4.7	3.0	2.2	1.6	1.2	.9	.7	.5	.3	.3
6	.0	5.4	4.1	2.7	2.1	1.5	1.2	.9	.7	.5	.3	.3
7	.0	4.1	3.5	2.5	1.9	1.5	1.1	.9	.7	.5	.3	.3
8	.0	3.0	3.0	2.3	1.8	1.4	1.1	.9	.6	.4	.3	.3
9	.0	2.1	2.4	2.0	1.7	1.3	1.0	.8	.6	.4	.3	.2
10	.0	1.4	2.0	1.8	1.5	1.2	1.0	.8	.6	.4	.3	.2
11	.0	.9	1.5	1.5	1.4	1.1	.9	.8	.6	.4	.3	.2
12	.0	.6	1.2	1.3	1.2	1.0	.9	.7	.6	.4	.3	.2
13	.0	.3	.9	1.1	1.1	1.0	.8	.7	.5	.4	.3	.2
14	.0	.2	.6	.9	1.0	.9	.8	.6	.5	.4	.3	.2
15	.0	.1	.5	.8	.8	.8	.7	.6	.5	.4	.3	.2
16	.0	.1	.3	.6	.7	.7	.6	.6	.5	.3	.3	.2
17	.0	.0	.2	.5	.6	.6	.6	.5	.4	.3	.3	.2
18	.0	.0	.1	.4	.5	.6	.5	.5	.4	.3	.3	.2
19	.0	.0	.1	.3	.4	.5	.5	.5	.4	.3	.2	.2
20	.0	.0	.1	.2	.4	.4	.4	.4	.4	.3	.2	.2
21	.0	.0	.0	.2	.3	.4	.4	.4	.3	.3	.2	.2
22	.0	.0	.0	.1	.2	.3	.4	.4	.3	.3	.2	.2
23	.0	.0	.0	.1	.2	.3	.3	.3	.3	.3	.2	.2
24	.0	.0	.0	.1	.2	.2	.3	.3	.3	.2	.2	.2
25	.0	.0	.0	.1	.1	.2	.2	.3	.3	.2	.2	.2
26	.0	.0	.0	.0	.1	.2	.2	.2	.2	.2	.2	.2
27	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2	.2	.1
28	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2	.2	.1
29	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2	.1
30	.0	.0	.0	.0	.0	.1	.1	.1	.2	.2	.1	.1

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 21.0 POL = V
SUN INCIDENCE ANGLE = 49 TO 29 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S)											
	0	1	2	4	6	8	10	12	15	20	25	30
0	441.6	11.6	6.4	3.6	2.5	1.8	1.3	1.0	.8	.5	.4	.3
1	141.5	11.5	6.4	3.6	2.5	1.8	1.3	1.0	.8	.5	.4	.3
2	4.1	10.9	6.2	3.6	2.5	1.8	1.3	1.0	.8	.5	.4	.3
3	.0	9.9	6.0	3.5	2.5	1.8	1.3	1.0	.8	.5	.4	.3
4	.0	8.7	5.6	3.4	2.4	1.8	1.3	1.0	.8	.5	.4	.3
5	.0	7.3	5.1	3.2	2.4	1.7	1.3	1.0	.8	.5	.4	.3
6	.0	5.9	4.5	3.0	2.3	1.7	1.3	1.0	.8	.5	.4	.3
7	.0	4.6	4.0	2.8	2.2	1.7	1.3	1.0	.7	.5	.4	.3
8	.0	3.4	3.4	2.6	2.0	1.6	1.2	1.0	.7	.5	.4	.3
9	.0	2.5	2.8	2.3	1.9	1.5	1.2	1.0	.7	.5	.4	.3
10	.0	1.7	2.3	2.1	1.8	1.4	1.1	.9	.7	.5	.4	.3
11	.0	1.1	1.8	1.9	1.6	1.4	1.1	.9	.7	.5	.4	.3
12	.0	.7	1.4	1.6	1.5	1.3	1.1	.9	.7	.5	.4	.3
13	.0	.4	1.1	1.4	1.3	1.2	1.0	.8	.7	.5	.4	.3
14	.0	.2	.8	1.2	1.2	1.1	1.0	.8	.7	.5	.4	.3
15	.0	.1	.6	1.0	1.1	1.0	.9	.8	.6	.5	.4	.3
16	.0	.1	.4	.8	.9	.9	.8	.7	.6	.5	.4	.3
17	.0	.0	.3	.7	.8	.8	.8	.7	.6	.4	.3	.3
18	.0	.0	.2	.6	.7	.8	.7	.7	.6	.4	.3	.3
19	.0	.0	.1	.4	.6	.7	.7	.6	.5	.4	.3	.3
20	.0	.0	.1	.3	.5	.6	.6	.6	.5	.4	.3	.3
21	.0	.0	.1	.3	.4	.5	.6	.6	.5	.4	.3	.3
22	0.	.0	.0	.2	.4	.5	.5	.5	.5	.4	.3	.3
23	0.	.0	.0	.2	.3	.4	.5	.5	.5	.4	.3	.3
24	0.	.0	.0	.1	.2	.4	.4	.4	.4	.4	.3	.3
25	0.	.0	.0	.1	.2	.3	.4	.4	.4	.4	.3	.3
26	0.	.0	.0	.1	.2	.3	.3	.4	.4	.3	.3	.2
27	0.	.0	.0	.0	.1	.2	.3	.3	.4	.3	.3	.2
28	0.	.0	.0	.0	.1	.2	.3	.3	.3	.3	.3	.2
29	0.	.0	.0	.0	.1	.2	.2	.3	.3	.3	.3	.2
30	0.	.0	.0	.0	.1	.1	.2	.3	.3	.3	.3	.2

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 21.0 POL = V
SUN INCIDENCE ANGLE = CONSTANT 49 DEG. SUN AZIMUTH ANGLE = 0 TO 40.1 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S)											
	0	1	2	4	6	8	10	12	15	20	25	30
0	441.6	11.6	6.4	3.6	2.5	1.8	1.3	1.0	.8	.5	.4	.3
1	140.6	11.1	6.3	3.5	2.5	1.8	1.3	1.0	.8	.5	.4	.3
2	4.5	9.7	5.8	3.4	2.4	1.8	1.3	1.0	.7	.5	.4	.3
3	.0	7.7	5.1	3.2	2.3	1.7	1.3	1.0	.7	.5	.4	.3
4	.0	5.7	4.3	2.9	2.2	1.6	1.2	1.0	.7	.5	.4	.3
5	.0	3.8	3.5	2.6	2.0	1.5	1.2	.9	.7	.5	.4	.3
6	.0	2.3	2.6	2.2	1.8	1.4	1.1	.9	.7	.5	.4	.3
7	.0	1.3	1.9	1.8	1.6	1.3	1.1	.9	.7	.5	.3	.3
8	.0	.7	1.3	1.5	1.4	1.2	1.0	.8	.6	.5	.3	.3
9	.0	.3	.9	1.2	1.2	1.1	.9	.8	.6	.4	.3	.3
10	.0	.1	.5	.9	1.0	.9	.8	.7	.6	.4	.3	.3
11	.0	.1	.3	.7	.8	.8	.7	.7	.6	.4	.3	.3
12	.0	.0	.2	.5	.6	.7	.7	.6	.5	.4	.3	.3
13	.0	.0	.1	.4	.5	.6	.6	.6	.5	.4	.3	.2
14	.0	.0	.1	.2	.4	.5	.5	.5	.5	.4	.3	.2
15	.0	.0	.0	.2	.3	.4	.5	.5	.4	.4	.3	.2
16	.0	.0	.0	.1	.2	.3	.4	.4	.4	.3	.3	.2
17	.0	.0	.0	.1	.2	.3	.3	.4	.4	.3	.3	.2
18	.0	.0	.0	.0	.1	.2	.3	.3	.3	.3	.3	.2
19	.0	.0	.0	.0	.1	.2	.2	.3	.3	.3	.3	.2
20	.0	.0	.0	.0	.1	.1	.2	.2	.3	.3	.2	.2
21	.0	.0	.0	.0	.0	.1	.2	.2	.2	.3	.2	.2
22	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2	.2
23	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2	.2
24	0.	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2
25	0.	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2
26	0.	.0	.0	.0	.0	.0	.1	.1	.1	.2	.2	.2
27	0.	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2
28	0.	.0	.0	.0	.0	.0	.0	.1	.1	.1	.2	.2
29	0.	.0	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2
30	0.	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 21.0 POL = H
SUN INCIDENCE ANGLE = 49 TO 79 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S)											
	0	1	2	4	6	8	10	12	15	20	25	30
0	696.6	18.3	10.1	5.7	4.0	2.9	2.1	1.6	1.2	.8	.6	.4
1	222.7	18.0	10.0	5.7	4.0	2.9	2.1	1.6	1.2	.8	.6	.4
2	8.1	17.0	9.7	5.6	4.0	2.8	2.1	1.6	1.2	.8	.6	.4
3	.0	15.4	9.3	5.4	3.9	2.8	2.1	1.6	1.2	.8	.6	.4
4	.0	13.5	8.6	5.2	3.8	2.8	2.1	1.6	1.2	.8	.6	.4
5	.0	11.3	7.8	5.0	3.7	2.7	2.0	1.6	1.2	.8	.6	.4
6	.0	9.1	7.0	4.7	3.5	2.6	2.0	1.6	1.2	.8	.6	.4
7	.0	7.1	6.1	4.3	3.3	2.5	1.9	1.5	1.1	.8	.6	.4
8	.0	5.3	5.2	4.0	3.1	2.4	1.9	1.5	1.1	.8	.6	.4
9	.0	3.8	4.3	3.6	2.9	2.3	1.8	1.5	1.1	.8	.6	.4
10	.0	2.6	3.5	3.2	2.7	2.2	1.7	1.4	1.1	.8	.6	.4
11	.0	1.7	2.8	2.8	2.5	2.1	1.7	1.4	1.1	.8	.6	.4
12	.0	1.1	2.2	2.5	2.3	1.9	1.6	1.3	1.0	.7	.6	.4
13	.0	.7	1.7	2.1	2.0	1.8	1.5	1.3	1.0	.7	.5	.4
14	.0	.4	1.2	1.8	1.8	1.7	1.4	1.2	1.0	.7	.5	.4
15	.0	.2	.9	1.5	1.6	1.5	1.3	1.2	1.0	.7	.5	.4
16	.0	.1	.6	1.3	1.4	1.4	1.3	1.1	.9	.7	.5	.4
17	.0	.1	.4	1.0	1.2	1.3	1.2	1.1	.9	.7	.5	.4
18	.0	.0	.3	.8	1.1	1.1	1.1	1.0	.9	.7	.5	.4
19	.0	.0	.2	.7	.9	1.0	1.0	.9	.8	.6	.5	.4
20	.0	.0	.1	.5	.8	.9	.9	.9	.8	.6	.5	.4
21	.0	.0	.1	.4	.6	.8	.8	.8	.8	.6	.5	.4
22	.0	.0	.1	.3	.5	.7	.8	.8	.7	.6	.5	.4
23	.0	.0	.0	.2	.4	.6	.7	.7	.7	.6	.5	.4
24	.0	.0	.0	.2	.4	.5	.6	.7	.6	.6	.5	.4
25	.0	.0	.0	.1	.3	.5	.6	.6	.6	.5	.4	.4
26	.0	.0	.0	.1	.2	.4	.5	.6	.6	.5	.4	.4
27	.0	.0	.0	.1	.2	.3	.4	.5	.5	.5	.4	.4
28	.0	.0	.0	.0	.1	.3	.4	.5	.5	.5	.4	.4
29	.0	.0	.0	.0	.1	.2	.3	.4	.5	.5	.4	.3
30	.0	.0	.0	.0	.1	.2	.3	.4	.4	.4	.4	.3

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 21.0 POL = H
SUN INCIDENCE ANGLE = 49 TO 29 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	696.6	18.3	10.1	5.7	4.0	2.9	2.1	1.6	1.2	.8	.6	.4
1	220.7	17.9	10.0	5.6	4.0	2.8	2.1	1.6	1.2	.8	.6	.4
2	6.3	16.8	9.6	5.5	3.9	2.8	2.1	1.6	1.2	.8	.6	.4
3	.0	15.2	9.1	5.3	3.8	2.8	2.0	1.6	1.2	.8	.6	.4
4	.0	13.2	8.4	5.1	3.7	2.7	2.0	1.6	1.2	.8	.6	.4
5	.0	11.0	7.6	4.8	3.5	2.6	2.0	1.5	1.1	.8	.6	.4
6	.0	8.8	6.7	4.5	3.4	2.5	1.9	1.5	1.1	.8	.6	.4
7	.0	6.7	5.8	4.1	3.2	2.4	1.8	1.5	1.1	.7	.5	.4
8	.0	5.0	4.9	3.7	3.0	2.3	1.8	1.4	1.1	.7	.5	.4
9	.0	3.5	4.1	3.4	2.7	2.2	1.7	1.4	1.0	.7	.5	.4
10	.0	2.4	3.3	3.0	2.5	2.1	1.6	1.3	1.0	.7	.5	.4
11	.0	1.6	2.6	2.6	2.3	1.9	1.6	1.3	1.0	.7	.5	.4
12	.0	1.0	2.0	2.3	2.1	1.8	1.5	1.2	1.0	.7	.5	.4
13	.0	.6	1.5	1.9	1.9	1.6	1.4	1.2	.9	.7	.5	.4
14	.0	.3	1.1	1.6	1.7	1.5	1.3	1.1	.9	.7	.5	.4
15	.0	.2	.8	1.4	1.5	1.4	1.2	1.1	.9	.6	.5	.4
16	.0	.1	.6	1.1	1.3	1.2	1.1	1.0	.8	.6	.5	.4
17	.0	.1	.4	.9	1.1	1.1	1.1	.9	.8	.6	.5	.4
18	.0	.0	.3	.7	.9	1.0	1.0	.9	.8	.6	.5	.4
19	.0	.0	.2	.6	.8	.9	.9	.8	.7	.6	.4	.4
20	.0	.0	.1	.5	.7	.8	.8	.8	.7	.5	.4	.3
21	.0	.0	.1	.3	.6	.7	.7	.7	.7	.5	.4	.3
22	0.	.0	.0	.3	.5	.6	.7	.7	.6	.5	.4	.3
23	0.	.0	.0	.2	.4	.5	.6	.6	.6	.5	.4	.3
24	0.	.0	.0	.1	.3	.4	.5	.6	.5	.5	.4	.3
25	0.	.0	.0	.1	.2	.4	.5	.5	.5	.4	.4	.3
26	0.	.0	.0	.1	.2	.3	.4	.5	.5	.4	.4	.3
27	0.	.0	.0	.1	.1	.3	.4	.4	.4	.4	.4	.3
28	0.	.0	.0	.0	.1	.2	.3	.4	.4	.4	.3	.3
29	0.	.0	.0	.0	.1	.2	.3	.3	.4	.4	.3	.3
30	0.	.0	.0	.0	.1	.2	.2	.3	.4	.4	.3	.3

SUN GLITTER TB (KELVIN) RECEIVED BY SOMR ANTENNA. FREQ = 21.0 POL = H
SUN INCIDENCE ANGLE = CONSTANT 49 DEG. SUN AZIMUTH ANGLE = 0 TO 40.1 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S)											
	0	1	2	4	6	8	10	12	15	20	25	30
0	696.6	18.3	10.1	5.7	4.0	2.9	2.1	1.6	1.2	.8	.6	.4
1	221.7	17.5	9.9	5.6	4.0	2.8	2.1	1.6	1.2	.8	.6	.4
2	7.1	15.3	9.2	5.4	3.8	2.8	2.1	1.6	1.2	.8	.6	.4
3	.0	12.2	8.1	5.0	3.7	2.7	2.0	1.6	1.2	.8	.6	.4
4	.0	8.9	6.8	4.5	3.4	2.6	1.9	1.5	1.1	.8	.6	.4
5	.0	5.9	5.4	4.0	3.1	2.4	1.8	1.5	1.1	.8	.6	.4
6	.0	3.6	4.1	3.4	2.8	2.2	1.7	1.4	1.1	.7	.5	.4
7	.0	2.0	3.0	2.8	2.5	2.0	1.6	1.3	1.0	.7	.5	.4
8	.0	1.0	2.0	2.3	2.1	1.8	1.5	1.3	1.0	.7	.5	.4
9	.0	.5	1.3	1.8	1.8	1.6	1.4	1.2	.9	.7	.5	.4
10	.0	.2	.8	1.4	1.5	1.4	1.3	1.1	.9	.7	.5	.4
11	.0	.1	.5	1.0	1.2	1.2	1.1	1.0	.8	.6	.5	.4
12	.0	.0	.3	.8	1.0	1.0	1.0	.9	.8	.6	.5	.4
13	.0	.0	.1	.5	.8	.9	.9	.8	.7	.6	.5	.4
14	.0	.0	.1	.4	.6	.7	.8	.7	.7	.5	.4	.4
15	.0	.0	.0	.2	.4	.6	.7	.7	.6	.5	.4	.3
16	.0	.0	.0	.2	.3	.5	.6	.6	.6	.5	.4	.3
17	.0	.0	.0	.1	.2	.4	.5	.5	.5	.5	.4	.3
18	.0	.0	.0	.1	.2	.3	.4	.5	.5	.4	.4	.3
19	.0	.0	.0	.0	.1	.2	.3	.4	.4	.4	.4	.3
20	.0	.0	.0	.0	.1	.2	.3	.3	.4	.4	.3	.3
21	.0	.0	.0	.0	.1	.1	.2	.3	.3	.3	.3	.3
22	.0	.0	.0	.0	.0	.1	.2	.2	.3	.3	.3	.3
23	.0	.0	.0	.0	.0	.1	.1	.2	.3	.3	.3	.3
24	0.	.0	.0	.0	.0	.1	.1	.2	.2	.3	.3	.2
25	0.	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2
26	0.	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2
27	0.	.0	.0	.0	.0	.0	.1	.1	.1	.2	.2	.2
28	0.	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2
29	0.	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2	.2
30	0.	.0	.0	.0	.0	.0	.0	.0	.1	.1	.2	.2

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 37.0 POL = V
SUN INCIDENCE ANGLE = 49 TO 79 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	626.4	5.3	2.9	1.6	1.1	.8	.6	.5	.3	.2	.2	.1
1	43.6	5.2	2.9	1.6	1.1	.8	.6	.4	.3	.2	.2	.1
2	.0	4.9	2.8	1.6	1.1	.8	.6	.4	.3	.2	.2	.1
3	.0	4.5	2.6	1.5	1.1	.8	.6	.4	.3	.2	.1	.1
4	.0	4.0	2.5	1.4	1.0	.8	.6	.4	.3	.2	.1	.1
5	.0	3.5	2.3	1.4	1.0	.7	.5	.4	.3	.2	.1	.1
6	.0	2.9	2.0	1.3	1.0	.7	.5	.4	.3	.2	.1	.1
7	.0	2.4	1.8	1.2	.9	.7	.5	.4	.3	.2	.1	.1
8	.0	1.9	1.6	1.1	.9	.6	.5	.4	.3	.2	.1	.1
9	.0	1.4	1.4	1.0	.8	.6	.5	.4	.3	.2	.1	.1
10	.0	1.1	1.2	.9	.7	.6	.5	.4	.3	.2	.1	.1
11	.0	.8	1.0	.8	.7	.5	.4	.3	.3	.2	.1	.1
12	.0	.5	.8	.7	.6	.5	.4	.3	.3	.2	.1	.1
13	.0	.4	.6	.7	.6	.5	.4	.3	.2	.2	.1	.1
14	.0	.2	.5	.6	.5	.4	.4	.3	.2	.2	.1	.1
15	.0	.2	.4	.5	.5	.4	.3	.3	.2	.2	.1	.1
16	.0	.1	.3	.4	.4	.4	.3	.3	.2	.2	.1	.1
17	.0	.1	.2	.4	.4	.3	.3	.3	.2	.2	.1	.1
18	.0	.0	.2	.3	.3	.3	.3	.2	.2	.1	.1	.1
19	0.	.0	.1	.2	.3	.3	.3	.2	.2	.1	.1	.1
20	0.	.0	.1	.2	.2	.3	.2	.2	.2	.1	.1	.1
21	0.	.0	.1	.2	.2	.2	.2	.2	.2	.1	.1	.1
22	0.	.0	.0	.1	.2	.2	.2	.2	.2	.1	.1	.1
23	0.	.0	.0	.1	.2	.2	.2	.2	.2	.1	.1	.1
24	0.	.0	.0	.1	.1	.2	.2	.2	.1	.1	.1	.1
25	0.	.0	.0	.1	.1	.1	.2	.1	.1	.1	.1	.1
26	0.	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1	.1
27	0.	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1	.1
28	0.	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1	.1
29	0.	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1
30	0.	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 37.0 POL = V
SUN INCIDENCE ANGLE = 49 TO 29 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	626.4	5.3	2.9	1.6	1.1	.8	.6	.5	.3	.2	.2	.1
1	42.8	5.3	2.9	1.6	1.1	.8	.6	.5	.3	.2	.2	.1
2	.0	5.1	2.9	1.6	1.1	.8	.6	.5	.3	.2	.2	.1
3	.0	4.8	2.8	1.6	1.1	.8	.6	.5	.3	.2	.2	.1
4	.0	4.3	2.6	1.6	1.1	.8	.6	.5	.3	.2	.2	.1
5	.0	3.8	2.5	1.5	1.1	.8	.6	.5	.3	.2	.2	.1
6	.0	3.3	2.3	1.5	1.1	.8	.6	.5	.3	.2	.2	.1
7	.0	2.7	2.1	1.4	1.0	.8	.6	.5	.3	.2	.2	.1
8	.0	2.2	1.9	1.3	1.0	.8	.6	.5	.3	.2	.2	.1
9	.0	1.7	1.6	1.2	1.0	.7	.6	.4	.3	.2	.2	.1
10	.0	1.3	1.4	1.1	.9	.7	.5	.4	.3	.2	.2	.1
11	.0	1.0	1.2	1.0	.9	.7	.5	.4	.3	.2	.2	.1
12	.0	.7	1.0	.9	.8	.6	.5	.4	.3	.2	.2	.1
13	.0	.5	.8	.8	.7	.6	.5	.4	.3	.2	.2	.1
14	.0	.3	.7	.7	.7	.6	.5	.4	.3	.2	.2	.1
15	0.	.2	.5	.7	.6	.6	.5	.4	.3	.2	.2	.1
16	0.	.1	.4	.6	.6	.5	.4	.4	.3	.2	.2	.1
17	0.	.1	.3	.5	.5	.5	.4	.4	.3	.2	.2	.1
18	0.	.0	.2	.4	.5	.5	.4	.4	.3	.2	.2	.1
19	0.	.0	.2	.4	.4	.4	.4	.4	.3	.2	.2	.1
20	0.	.0	.1	.3	.4	.4	.4	.3	.3	.2	.2	.1
21	0.	.0	.1	.3	.3	.4	.3	.3	.3	.2	.2	.1
22	0.	.0	.1	.2	.3	.3	.3	.3	.3	.2	.2	.1
23	0.	.0	.0	.2	.2	.3	.3	.3	.2	.2	.2	.1
24	0.	.0	.0	.1	.2	.3	.3	.3	.2	.2	.1	.1
25	0.	.0	.0	.1	.2	.2	.3	.3	.2	.2	.1	.1
26	0.	.0	.0	.1	.2	.2	.2	.2	.2	.2	.1	.1
27	0.	.0	.0	.1	.1	.2	.2	.2	.2	.2	.1	.1
28	0.	.0	.0	.1	.1	.2	.2	.2	.2	.2	.1	.1
29	0.	.0	.0	.0	.1	.1	.2	.2	.2	.2	.1	.1
30	0.	.0	.0	.0	.1	.1	.2	.2	.2	.2	.1	.1

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 37.0 POL = V
SUN INCIDENCE ANGLE = CONSTANT 49 DEG. SUN AZIMUTH ANGLE = 0 TO 40.1 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S)											
	0	1	2	4	6	8	10	12	15	20	25	30
0	626.4	5.3	2.9	1.6	1.1	.8	.6	.5	.3	.2	.2	.1
1	43.2	5.1	2.9	1.6	1.1	.8	.6	.5	.3	.2	.2	.1
2	.0	4.6	2.7	1.6	1.1	.8	.6	.4	.3	.2	.2	.1
3	.0	3.9	2.5	1.5	1.1	.8	.6	.4	.3	.2	.2	.1
4	.0	3.1	2.2	1.4	1.0	.7	.6	.4	.3	.2	.2	.1
5	.0	2.3	1.8	1.3	1.0	.7	.5	.4	.3	.2	.2	.1
6	.0	1.6	1.5	1.1	.9	.7	.5	.4	.3	.2	.2	.1
7	.0	1.0	1.2	1.0	.8	.6	.5	.4	.3	.2	.2	.1
8	.0	.6	.9	.9	.7	.6	.5	.4	.3	.2	.1	.1
9	.0	.3	.7	.7	.6	.6	.4	.4	.3	.2	.1	.1
10	.0	.2	.5	.6	.6	.5	.4	.4	.3	.2	.1	.1
11	.0	.1	.3	.5	.5	.5	.4	.3	.3	.2	.1	.1
12	.0	.0	.2	.4	.4	.4	.4	.3	.3	.2	.1	.1
13	.0	.0	.1	.3	.4	.4	.3	.3	.2	.2	.1	.1
14	.0	.0	.1	.2	.3	.3	.3	.3	.2	.2	.1	.1
15	.0	.0	.0	.2	.2	.3	.3	.3	.2	.2	.1	.1
16	0.	.0	.0	.1	.2	.2	.2	.2	.2	.2	.1	.1
17	0.	.0	.0	.1	.2	.2	.2	.2	.2	.2	.1	.1
18	0.	.0	.0	.1	.1	.2	.2	.2	.2	.2	.1	.1
19	0.	.0	.0	.0	.1	.1	.2	.2	.2	.2	.1	.1
20	0.	.0	.0	.0	.1	.1	.2	.2	.2	.1	.1	.1
21	0.	.0	.0	.0	.1	.1	.1	.2	.2	.1	.1	.1
22	0.	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1
23	0.	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1
24	0.	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1	.1
25	0.	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1
26	0.	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1
27	0.	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1
28	0.	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1
29	0.	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1
30	0.	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 37.0 POL = H
SUN INCIDENCE ANGLE = 49 TO 79 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	1071.4	9.1	5.0	2.8	1.9	1.4	1.0	.8	.6	.4	.3	.2
1	75.6	9.0	4.9	2.8	1.9	1.4	1.0	.8	.6	.4	.3	.2
2	.0	8.6	4.8	2.7	1.9	1.4	1.0	.8	.6	.4	.3	.2
3	.0	8.0	4.7	2.7	1.9	1.4	1.0	.8	.6	.4	.3	.2
4	.0	7.3	4.4	2.6	1.9	1.4	1.0	.8	.6	.4	.3	.2
5	.0	6.4	4.1	2.5	1.8	1.3	1.0	.8	.6	.4	.3	.2
6	.0	5.4	3.8	2.4	1.8	1.3	1.0	.8	.6	.4	.3	.2
7	.0	4.5	3.4	2.3	1.7	1.3	1.0	.8	.6	.4	.3	.2
8	.0	3.6	3.1	2.1	1.6	1.2	.9	.7	.6	.4	.3	.2
9	.0	2.8	2.7	2.0	1.6	1.2	.9	.7	.5	.4	.3	.2
10	.0	2.1	2.3	1.8	1.5	1.2	.9	.7	.5	.4	.3	.2
11	.0	1.6	1.9	1.7	1.4	1.1	.9	.7	.5	.4	.3	.2
12	.0	1.1	1.6	1.5	1.3	1.1	.8	.7	.5	.4	.3	.2
13	.0	.8	1.3	1.4	1.2	1.0	.8	.7	.5	.4	.3	.2
14	.0	.5	1.1	1.2	1.1	1.0	.8	.7	.5	.4	.3	.2
15	.0	.3	.8	1.1	1.0	.9	.8	.6	.5	.4	.3	.2
16	.0	.2	.7	.9	.9	.8	.7	.6	.5	.3	.3	.2
17	.0	.1	.5	.8	.8	.8	.7	.6	.5	.3	.3	.2
18	.0	.1	.4	.7	.8	.7	.6	.6	.5	.3	.3	.2
19	0.	.0	.3	.6	.7	.7	.6	.5	.4	.3	.3	.2
20	0.	.0	.2	.5	.6	.6	.6	.5	.4	.3	.2	.2
21	0.	.0	.1	.4	.5	.6	.5	.5	.4	.3	.2	.2
22	0.	.0	.1	.3	.5	.5	.5	.5	.4	.3	.2	.2
23	0.	.0	.1	.3	.4	.5	.5	.4	.4	.3	.2	.2
24	0.	.0	.0	.2	.3	.4	.4	.4	.4	.3	.2	.2
25	0.	.0	.0	.2	.3	.4	.4	.4	.4	.3	.2	.2
26	0.	.0	.0	.1	.2	.3	.4	.4	.4	.3	.2	.2
27	0.	.0	.0	.1	.2	.3	.3	.4	.3	.3	.2	.2
28	0.	.0	.0	.1	.2	.3	.3	.3	.3	.3	.2	.2
29	0.	.0	.0	.1	.1	.2	.3	.3	.3	.3	.2	.2
30	0.	.0	.0	.0	.1	.2	.3	.3	.3	.3	.2	.2

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 37.0 POL = H
SUN INCIDENCE ANGLE = 49 TO 29 DEG. SUN AZIMUTH ANGLE = CONSTANT 0 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	1071.4	9.1	5.0	2.8	1.9	1.4	1.0	.8	.6	.4	.3	.2
1	72.2	8.9	4.9	2.7	1.9	1.4	1.0	.8	.6	.4	.3	.2
2	.0	8.5	4.8	2.7	1.9	1.4	1.0	.8	.6	.4	.3	.2
3	.0	7.9	4.6	2.6	1.9	1.3	1.0	.8	.6	.4	.3	.2
4	.0	7.0	4.3	2.5	1.8	1.3	1.0	.8	.5	.4	.3	.2
5	.0	6.1	4.0	2.4	1.8	1.3	1.0	.7	.5	.4	.3	.2
6	.0	5.2	3.6	2.3	1.7	1.2	.9	.7	.5	.4	.3	.2
7	.0	4.3	3.3	2.2	1.6	1.2	.9	.7	.5	.4	.3	.2
8	.0	3.4	2.9	2.0	1.5	1.2	.9	.7	.5	.3	.3	.2
9	.0	2.6	2.5	1.9	1.5	1.1	.9	.7	.5	.3	.2	.2
10	.0	2.0	2.1	1.7	1.4	1.1	.8	.7	.5	.3	.2	.2
11	.0	1.4	1.8	1.5	1.3	1.0	.8	.6	.5	.3	.2	.2
12	.0	1.0	1.5	1.4	1.2	1.0	.8	.6	.5	.3	.2	.2
13	.0	.7	1.2	1.2	1.1	.9	.7	.6	.5	.3	.2	.2
14	.0	.5	1.0	1.1	1.0	.9	.7	.6	.5	.3	.2	.2
15	0.	.3	.7	.9	.9	.8	.7	.6	.4	.3	.2	.2
16	0.	.2	.6	.8	.8	.7	.6	.5	.4	.3	.2	.2
17	0.	.1	.4	.7	.7	.7	.6	.5	.4	.3	.2	.2
18	0.	.1	.3	.6	.7	.6	.6	.5	.4	.3	.2	.2
19	0.	.0	.2	.5	.6	.6	.5	.5	.4	.3	.2	.2
20	0.	.0	.2	.4	.5	.5	.5	.4	.4	.3	.2	.2
21	0.	.0	.1	.3	.4	.5	.5	.4	.4	.3	.2	.2
22	0.	.0	.1	.3	.4	.4	.4	.4	.3	.3	.2	.2
23	0.	.0	.1	.2	.3	.4	.4	.4	.3	.3	.2	.2
24	0.	.0	.0	.2	.3	.3	.4	.4	.3	.2	.2	.2
25	0.	.0	.0	.1	.2	.3	.3	.3	.3	.2	.2	.2
26	0.	.0	.0	.1	.2	.3	.3	.3	.3	.2	.2	.2
27	0.	.0	.0	.1	.2	.2	.3	.3	.3	.2	.2	.1
28	0.	.0	.0	.1	.1	.2	.3	.3	.3	.2	.2	.1
29	0.	.0	.0	.0	.1	.2	.2	.2	.2	.2	.2	.1
30	0.	.0	.0	.0	.1	.2	.2	.2	.2	.2	.2	.1

SUN GLITTER TB (KELVIN) RECEIVED BY SMMR ANTENNA. FREQ = 37.0 POL = H
SUN INCIDENCE ANGLE = CONSTANT 49 DEG. SUN AZIMUTH ANGLE = 0 TO 40.1 DEG.

SUN ANGLE (DEG)	WIND SPEED (M/S) 0	1	2	4	6	8	10	12	15	20	25	30
0	1071.4	9.1	5.0	2.8	1.9	1.4	1.0	.8	.6	.4	.3	.2
1	73.8	8.8	4.9	2.7	1.9	1.4	1.0	.8	.6	.4	.3	.2
2	.0	7.9	4.6	2.6	1.9	1.4	1.0	.8	.6	.4	.3	.2
3	.0	6.7	4.2	2.5	1.8	1.3	1.0	.8	.6	.4	.3	.2
4	.0	5.2	3.7	2.3	1.7	1.3	.9	.7	.5	.4	.3	.2
5	.0	3.8	3.1	2.1	1.6	1.2	.9	.7	.5	.4	.3	.2
6	.0	2.6	2.5	1.9	1.5	1.1	.9	.7	.5	.4	.3	.2
7	.0	1.7	2.0	1.7	1.4	1.1	.8	.7	.5	.3	.3	.2
8	.0	1.0	1.5	1.4	1.2	1.0	.8	.6	.5	.3	.2	.2
9	.0	.6	1.1	1.2	1.1	.9	.7	.6	.5	.3	.2	.2
10	.0	.3	.8	1.0	.9	.8	.7	.6	.5	.3	.2	.2
11	.0	.1	.5	.8	.8	.7	.6	.5	.4	.3	.2	.2
12	.0	.1	.3	.6	.7	.7	.6	.5	.4	.3	.2	.2
13	.0	.0	.2	.5	.6	.6	.5	.5	.4	.3	.2	.2
14	.0	.0	.1	.4	.5	.5	.5	.4	.4	.3	.2	.2
15	.0	.0	.1	.3	.4	.4	.4	.4	.4	.3	.2	.2
16	0.	.0	.0	.2	.3	.4	.4	.4	.3	.3	.2	.2
17	0.	.0	.0	.1	.2	.3	.3	.3	.3	.2	.2	.2
18	0.	.0	.0	.1	.2	.3	.3	.3	.3	.2	.2	.2
19	0.	.0	.0	.1	.1	.2	.3	.3	.3	.2	.2	.2
20	0.	.0	.0	.0	.1	.2	.2	.2	.2	.2	.2	.1
21	0.	.0	.0	.0	.1	.1	.2	.2	.2	.2	.2	.1
22	0.	.0	.0	.0	.1	.1	.2	.2	.2	.2	.2	.1
23	0.	.0	.0	.0	.0	.1	.1	.2	.2	.2	.2	.1
24	0.	.0	.0	.0	.0	.1	.1	.1	.2	.2	.2	.1
25	0.	.0	.0	.0	.0	.1	.1	.1	.2	.2	.1	.1
26	0.	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1
27	0.	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1
28	0.	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1	.1
29	0.	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1
30	0.	.0	.0	.0	.0	.0	.0	.1	.1	.1	.1	.1