

## MEASUREMENTS OF THERMOSPHERIC RESPONSE TO AURORAL ACTIVITIES

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The Joule heating produced by auroral electrojets and its thermospheric response can be studied by monitoring the thermospheric temperatures by optical methods; simultaneously, the concurrent auroral electrojet activities can be investigated by using geomagnetic records obtained from stations along a meridian close to the observation site of optical measurements.

We report, in this paper, the measurements of thermospheric response to auroral activities which were made at Albany (42.68°N, 73.82°W), New York on September 2, 1978 (UT) when an isolated substorm occurred. The thermospheric temperatures were measured by using a high-resolution Fabry-Perot interferometer that determines the line profiles of the [OI] 6300 Å line emission. The intensities and latitudinal positions of auroral electrojets were obtained by the analysis of magnetograms from the IMS Fort Churchill meridian chain stations.

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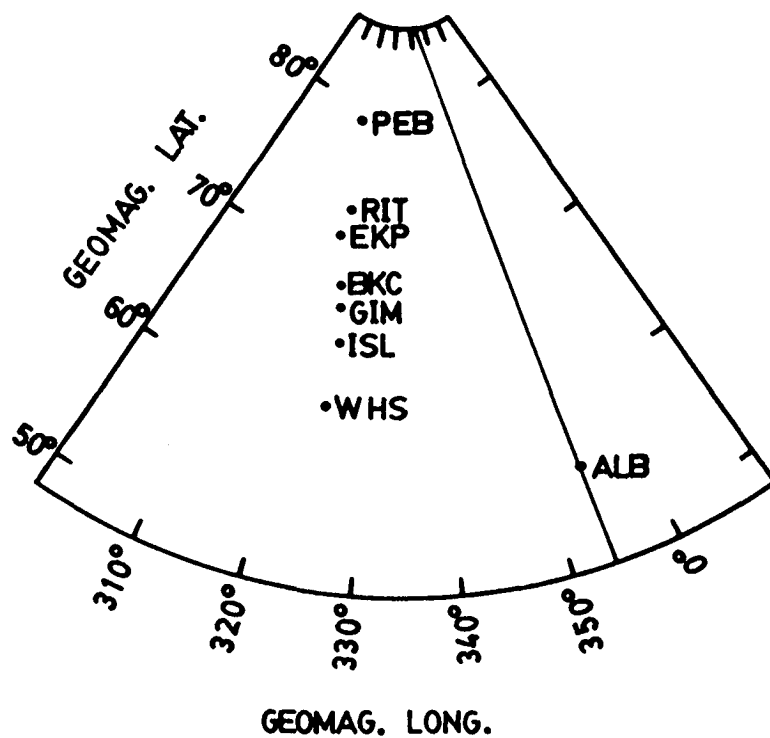


Figure 1. Locations of magnetic stations and Albany, New York in geomagnetic coordinates.

IMS NETWORK 1-MIN DATA  
1978/ 9/2

0000-1000 UT  
(350 GAMMA/DIV)

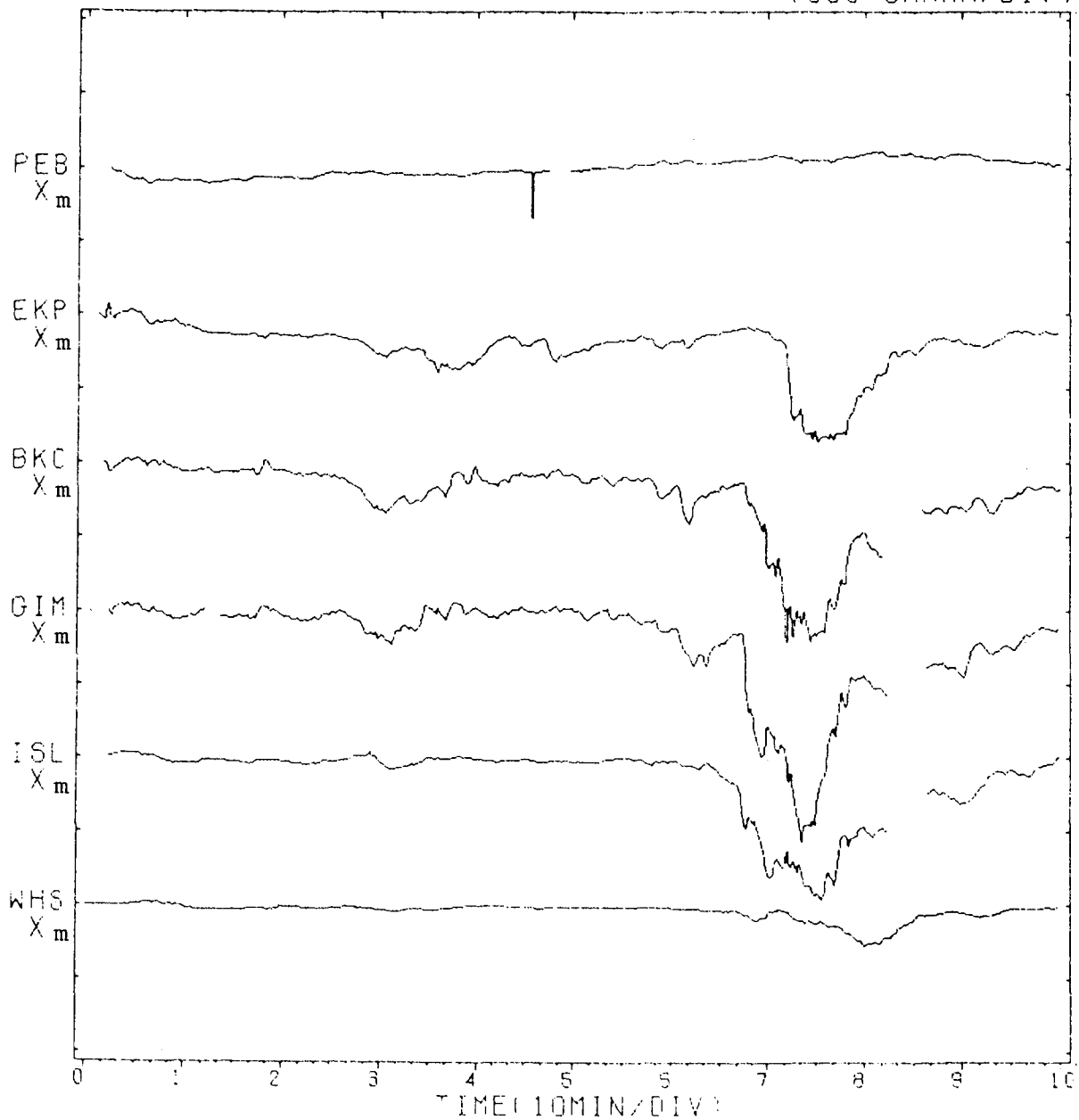


Figure 2a. The plots of the one-minute averages of  $X_m$  (magnetic north) components observed at stations in the Fort Churchill chain on September 2, 1978 (UT).

IMS NETWORK 1-MIN DATA  
1978/ 9/2

0000-1000 UT  
(350 GAMMA/DIV)

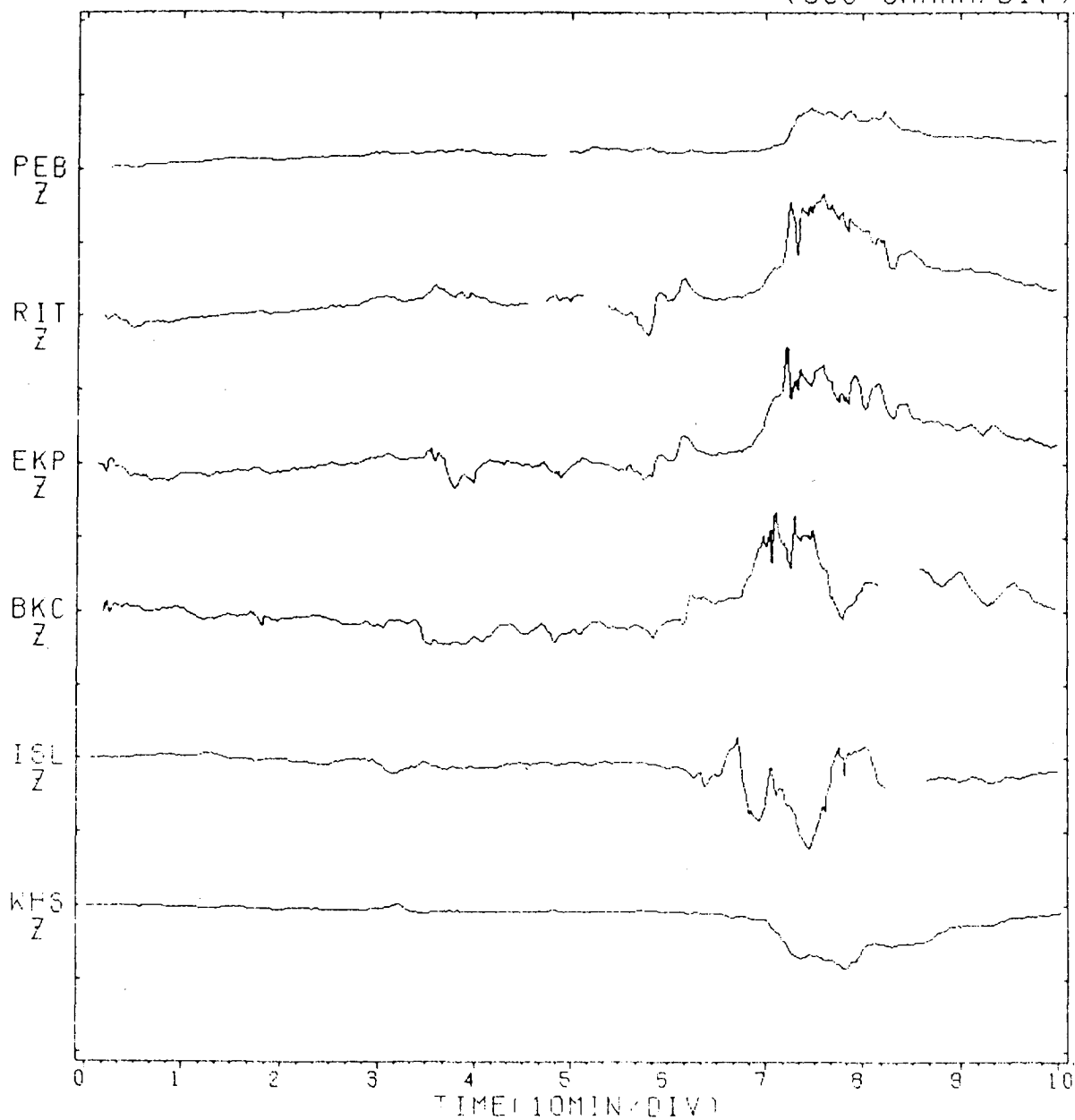


Figure 2b. The plots of the one-minute averages of Z (downward) components observed at stations in the Fort Churchill chain on September 2, 1978 (UT).

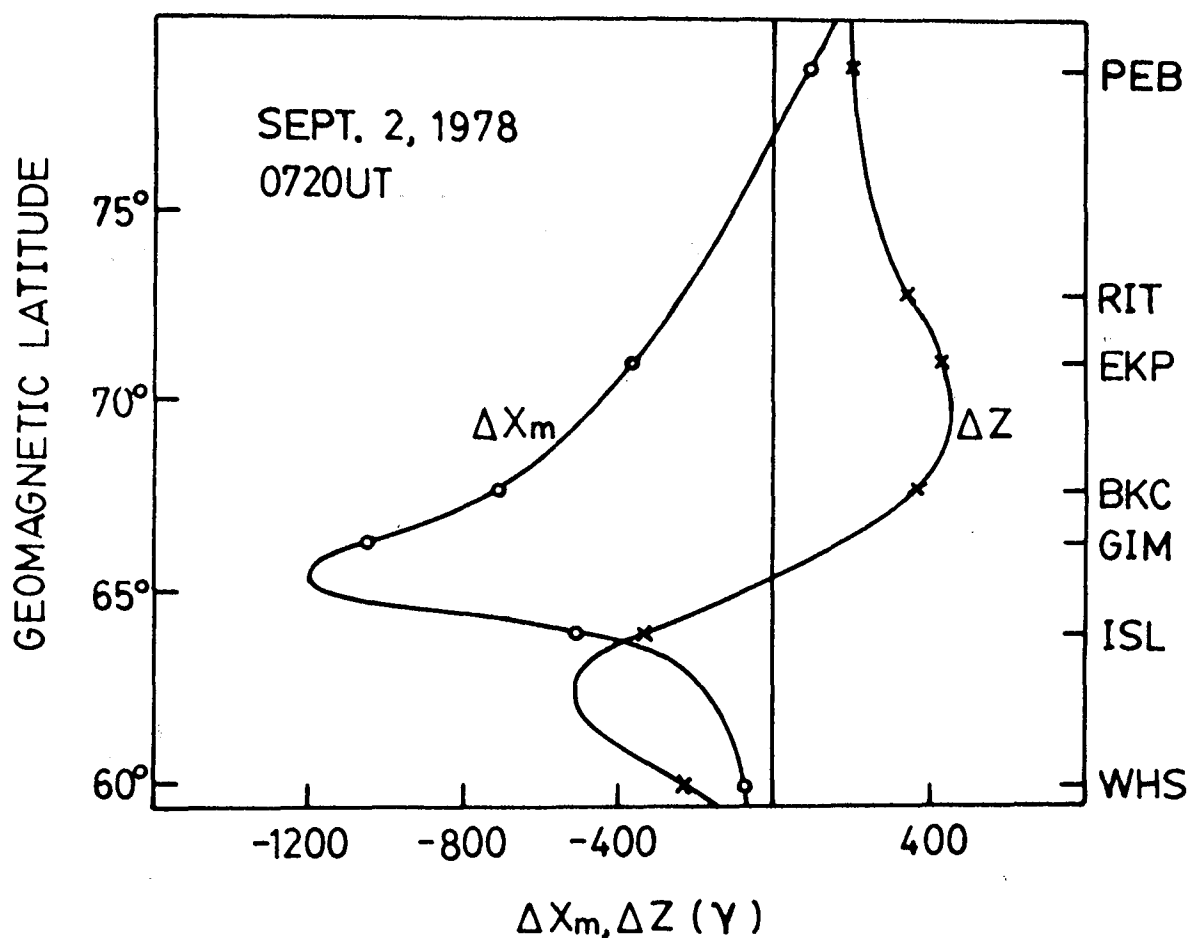


Figure 3.  $\Delta X_m$  and  $\Delta Z$  values at 0720 UT on September 2, 1978 from each station were plotted and the best-fitted curves were drawn through  $\Delta X_m$  and  $\Delta Z$  data, respectively, in order to determine the position and intensity of the westward electrojet.

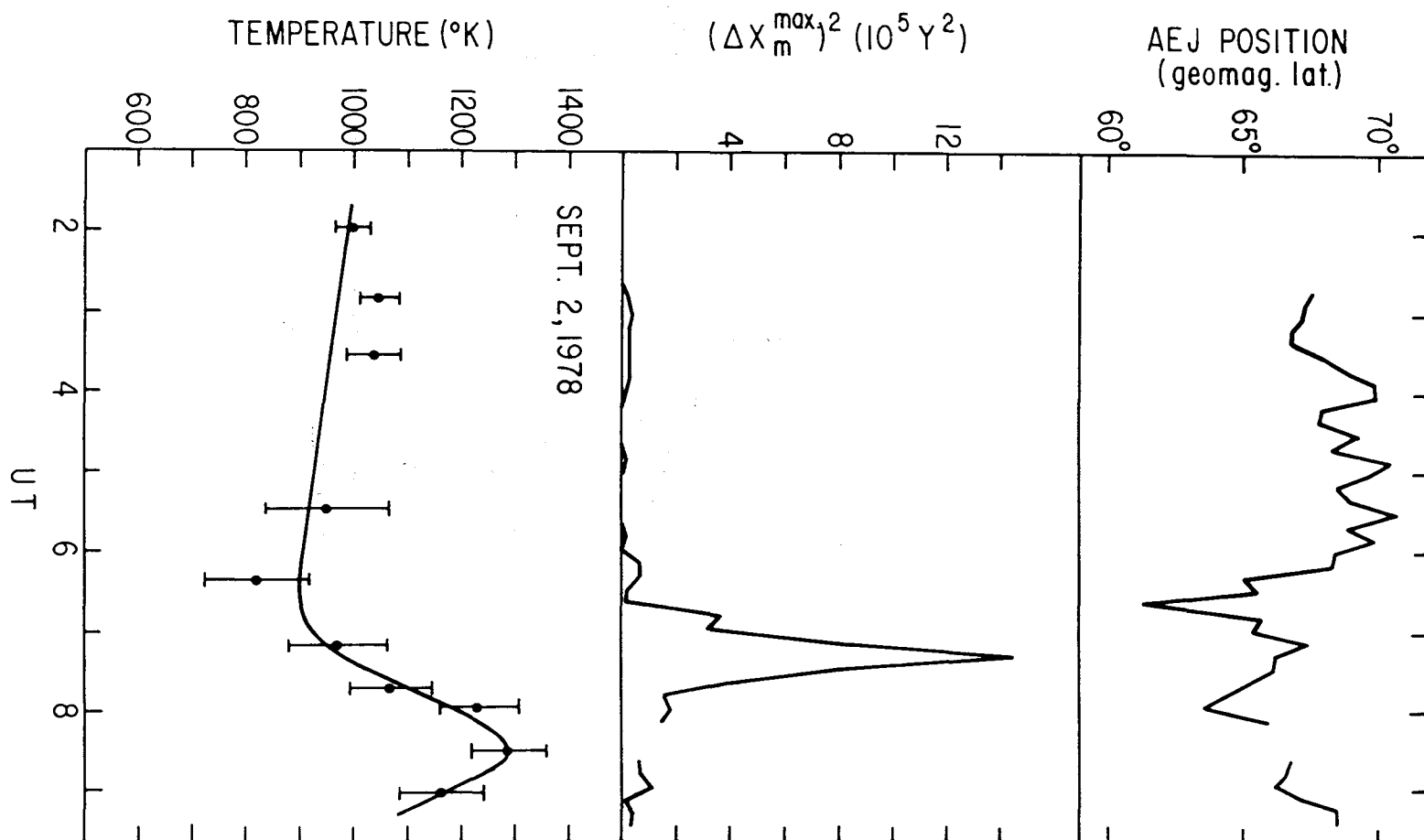


Figure 4. The position of electrojet and  $(\Delta X_m^{\max})^2$  value that were obtained by the analysis of magnetograms from the IMS Fort Churchill meridian chain stations and thermospheric temperature measured from Albany, New York are plotted as a function of universal time from top to bottom, respectively.