power was averaged over 1-hour intervals. In addition, the power was averaged over several frequency steps in each Fourier spectrum. The resulting power contours for a typical day, as a function of frequency and time of day, are displayed in fig. 4. The corresponding K_p index also is displayed for comparison.

Several daily plots of power contours must be compared in order to derive meaningful patterns of micropulsation activity and its relation to other activity indices. For example, it is not appropriate to conclude that energy in the frequency band 0.1-0.2 hertz is necessarily correlated with K_p on the basis of one illustrative figure. In fact, the power enhancement at higher frequencies that occur around 0700 probably is related to a diurnal variation in certain routinely occurring magnetospheric processes.

We are preparing an average quiet day power contour pattern for the station for use in normalizing the plots. The resulting residual activity then should relate more directly to anomalous magnetic activity and related geophysical processes. If successful, the micropulsation activity will provide a good diagnostic for magnetospheric and solar wind variations.

Reference

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Observations of geomagnetic micropulsations, 1972

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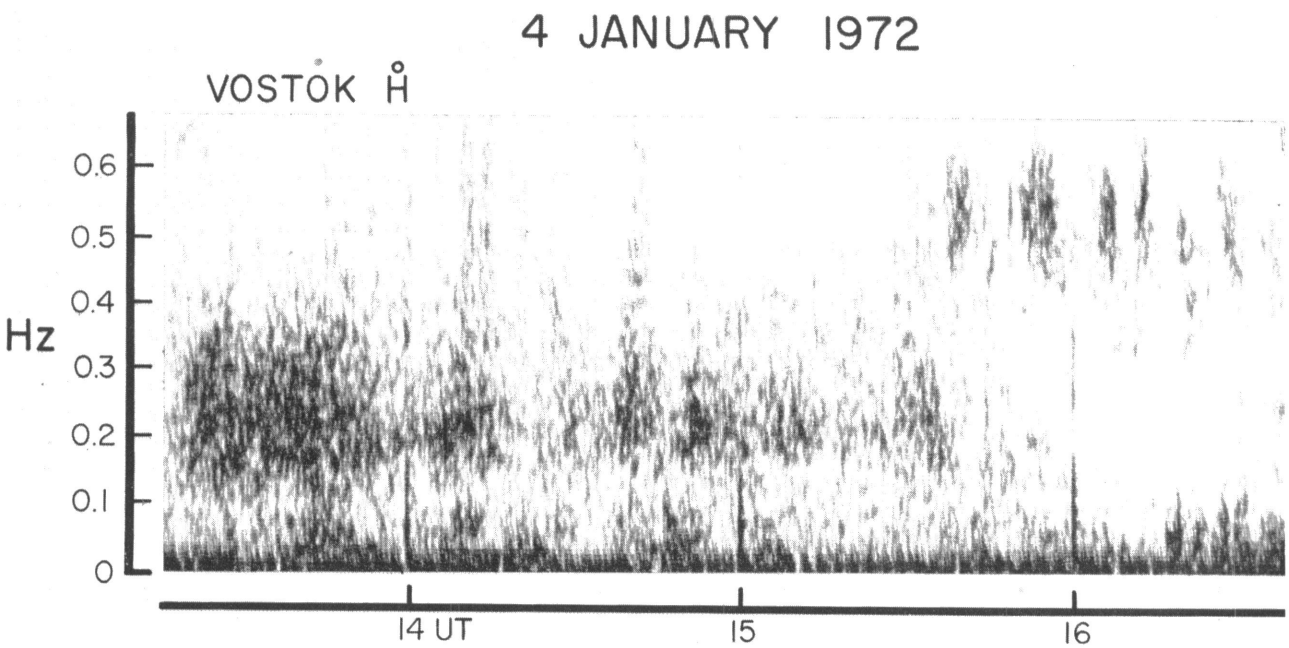
Operation of the 3-component induction magnetometer system at Vostok Station continued through 1972, in cooperation with Soviet scientists of the Arctic and Antarctic Scientific Research Institute, Leningrad. Another system simultaneously was operated near Thule, Greenland, in cooperation with the Danish Ionospheric Laboratory, Lyngby. Scientists of the Institute of Physics of the Earth, Moscow, are helping to analyze the Vostok data.

Periodically-structured Pc 1 micropulsation events recorded at either pole site were utilized in studies showing that these events strongly tend to occur during the latter part of the ring current recovery phase. This suggests that the waves are produced in the intersection region of the ring current and the filling plasmasphere (Heacock and Kivinen, 1972; Heacock and Akasofu, 1973).

Results of analyses of Vostok and Thule Pc 1-2 data are consistent with the existence of two main magnetospheric regions of Pc 1-2 generation, the outer portion of the plasmasphere and the dayside cusp region. We have



Example of unstructured and semistructured Pc 1-2 activtiy. The Kp index was 1—.

found no evidence that significant levels of Pc 1-2 are generated within regions where the cold plasma densities are relatively low, for example in the trough or on open polar cap lines. Unstructured Pc 1-2 signals, 0.1 to 0.5 hertz, are received at the pole sites preferentially at times when the dayside cusp is closest to the poles. Wave polarization characteristics of these unstructured Pc 1-2 events are consistent with a superposition of events from several source tubes longitudinally spaced in the cusp. An example of this type of activity is shown in the figure.

A study of longer period micropulsation activity observed at pole sites has been completed by Troitskaya *et al.* The results were to have been presented at the September 1973 International Association of Geomagnetism and Aeronomy assembly, at Kyoto.

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Geomagnetic observatory operations at South Pole Station, 1972-1973

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A geomagnetic observatory was operated at South Pole Station by the National Oceanic and Atmospheric Administration (NOAA) this past year, as part of NOAA's geomagnetic program that consists of geomagnetic observatories, repeat geomagnetic surveys, chart compilation, and research and development activities.

The experiments included the use of a Ruska magnetograph, photographically recording at 20 millimeters per hour with scale values of approximately 29 gammas per millimeter for horizontal intensity, 25 gammas per millimeter for vertical intensity, and 6.4 minutes per millimeter for declination. A proton precession magnetometer, a quartz horizontal magnetometer (QHM) and a Ruska suspension system magnetometer also were used, to maintain baseline control for determination of absolute values from the magnetogram.

NOAA's geomagnetism program is part of an international effort to understand, predict and utilize the natural phenomena of the earth's magnetic field. The global character of the field makes it imperative that both the service and research aspects of the program be carried out with as much international cooperation as possible.

The South Pole observatory is one of a network of twelve operated by NOAA. The primary "in-house" uses of the data include studies of the long period slow changes for magnetic charting and field modeling for solid earth studies. South Pole data help fill a large areal gap in the data coverage required for analytic studies and techniques directed toward the description of the field and its time changes that must be known for magnetic charting activities. More rapid changes in the field are used for correlation studies with many types of upper atmospheric phenomena.

Specific areas of study that benefit from the South Pole data are in the gathering of precise information on the temporal variations in the field vectors and their correlation with data from similar stations, high order accuracy data on the secular change rates of the geomagnetic field in Antarctica, data for correlation with ionospheric and auroral activity, and correlation of ground level magnetic data with that gathered by satellite.

In an effort to support global studies of geomagnetism and related activities, NOAA operates the World Data Center A, located in Boulder, Colorado. The South Pole data are deposited in the center shortly after arrival from Antarctica, and then are made available to researchers who are working throughout the world. The center disseminates in tabular form the selected effects and storm reports and K-indices. Hourly magnetic values and 2.5 minute values (for some years) are available in tabular form, and also on magnetic tape and punched cards.

Geophysical monitoring for climatic change

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Amundsen-Scott South Pole Station is designated as one of six "clean air" Geophysical Monitoring Observatories of the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce. Long-term measurements will be made there to learn more about atmospheric constituents and related parameters that can influence climate or shed light on climatic processes. The dependence of our technological society on climate is becoming increasingly recognized, as is the