

Section 4. Whistlers and Related Phenomena

From the preliminary experiments of the direction of arrival and the polarization successfully carried out at a low-latitude station of Takayama (geomag. lat. 26°), the following results have been shown, (i) the exit points of observed whistlers are located several tens of kilometers approximately north-north-east of the observing site and (ii) although a few whistlers have shown the polarization very close to circular, the polarization of most whistlers are generally elliptical, indicating the effect of multi-rays propagating in the earth-ionosphere waveguide. The system of using two crossed loops and a vertical monopole is, in principle, based on Cray's method and is effective for elliptically polarized waves. And by using this system a couple of test observations have been successively made at Moshiri since last autumn.

A real time whistler analyzer has been developed to measure the occurrence and dispersion of whistlers, by making use of a frequency modulated nature of whistlers. This analyzer is very useful for isolated pure-tone whistlers but a more device is needed for an efficient detection of diffused and multi-flash whistlers, though. The real time whistler analyzer will be used in the near future in exchange of the usual aural and sonograph system of reduction of routine data. The analyzer has been already installed at Sakushima and Kagoshima observatories to investigate its efficiency in a long period in comparison with the usual routine method. And we have, finally, expected a real time whistler analyzer combined with DF system, and the synthesized system of data reduction in connection with a computer.

By using the data in 1973 and 1975 from routine observations of locating atmospheric sources by the triangulation DF network, the seasonal contour maps were made in the occurrence frequency of atmospheric. In order to solve the ambiguity in fixing the sources in the region along the base line of DF stations in Japan Islands, the triangulation DF should be carried out simultaneously with the Group Delay Time Difference method (GDD) introduced by Frisius et al.. From the

results of GDD test observations in connection with the triangulation DF network, the utility of GDD method has been experimentally demonstrated in fixing atmospheric sources in the south-east area of Asia along the base line. The GDD method, however, has a problem to be solved that fixing points by GDD are generally scattered as compared with the ones by the triangulation DF.

A DF observation based on the principle of the arrival time difference measurement of an atmospheric at three stations including Sakushima was made in last October, of which the data are now in reduction.

The renewed system of data reduction of the triangulation DF network will be in operation in this May in connection with the installation of an enhanced computer system at Toyokawa.

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