

#### Section. 4 Whistlers and VLF Emissions

At the observatories, Moshiri, Sakushima and Kagoshima, the routine observation on whistlers has been made and will be continued for the time being. Moreover, the observation of low latitude nose whistlers up to 100 KHz will be made at Moshiri this winter.

The routine observation on VLF emissions has been continued at Moshiri and Kagoshima observatories. The apparatus for VLF emissions observation at Moshiri is now being renewed entirely by the use of new techniques applied to integrated circuit. Data exchange on VLF emissions between our stations and European stations proposed by Dr. Harang, has recently been realized and will be continued at least for one or two years in order to investigate the location and dimension of source of VLF hiss and their generation mechanism during a geomagnetic storm.

Propagation through a field aligned duct for the Alfvén wave was theoretically studied from the stand of wave theory. It has been found that the ducted propagation is possible only for a trough type duct, and a relation between wave frequency and minimum duct width has been obtained as a function of ion gyrofrequency and plasma frequency. Scattering characteristics of the obliquely incident electromagnetic waves by a cylindrical irregularity in plasma was investigated, too.

The observation of whistlers and VLF emissions, as described in the previous papers, has been carried out by Mr. Y. Tanaka, at Showa Base in the Antarctic, since Jan. 1968. This observation will be continued until Jan. 1970 by Mr. S. Tokuda who will take over them in Jan. 1969.

The observation of VLF radio wave noise with rockets L-3H-4 and K-9M-26, which were expected to launch in 1967 and 1968, has been stopped by a political trouble of fishery compensation since April 1967. This observation will be resumed in 1969. On the one hand, the same observation with a satellite is now being planned by us and other groups. This satellite named REXS is expected to flight in the autumn of 1970.

Since May 1967, in order to locate automatically the atmospheric sources, a new direction finding network system has been constructed by us. The direction finding system of crossed loop antenna for the location of distant sources, has been constructed in June 1968 and been used for test observations from July to October 1968. At present, the site error of each station is investigated and the routine observation using this system will begin in spring 1969. Another system of Adcock antenna for the location of near-by sources, is now under construction and will be completed in spring 1969.

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