ELF AND VLF ELECTRIC FIELD MEASUREMENTS WITH THE INTERKOSMOS 10 SATELLITE

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Summary: The ELF-VLF experiment onboard the Interkosmos 10 satellite consisted mainly of a broadband receiver covering the frequency range from 20 Hz to 22 kHz. The signal level in this broad band has also been measured, as well as the level in two narrow bands with centre frequencies of 720 Hz and 4 kHz. The electric component of the ELF-VLF fields has been measured by using an electric dipole antenna, 2.35 m in length. The purpose of this paper is to characterise the data obtained by the broadband RTT transmissions at the Panská Ves station during the seven-months active period of the satellite. The spectral analysis of all broad-band ELF-VLF recordings has been used. Examples of some typical phenomena, most frequently observed at different invariant latitudes are given.

1. INTRODUCTION

The Interkosmos 10 satellite was launched into a low-altitude elliptical orbit on 30 Oct. 1973 with the following orbital parameters: perigee 265 km, apogee 1477 km, period 102 min., inclination 74°. The scientific experiments onboard for studying the magnetosphere-ionosphere coupling were prepared by several research institutes of the USSR, GDR and CSSR as part of the Interkosmos programme of scientific co-operation. These experiments included measurements of ELF and VLF electric fields in the 0.02—22 kHz frequency band and of variable electric fields with frequencies of 0.03—70 Hz, magnetic field measurements with a three-component magnetometer, measurements of the energetic spectrum of electrons with energies between 0.05 and 20 keV, as well as electron density and temperature measurements made with a Langmuir probe of a high time-resolution.

Fig. 2. Location of the electric dipole for ELF-VLF measurements. A and B are spherical electrodes of which the dipole consists.

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