

SPACE EXPLORATION SYMPOSIUM (A3)
Poster Session (P)

Author: Dr. Alexander Potapov

Institute of Solar-Terrestrial Physics, Russian Academy of Sciences (RAS), Siberian Branch, Russian Federation, potapov@iszf.irk.ru

Mrs. Tatyana Polyushkina

Institute of Solar-Terrestrial Physics, Russian Academy of Sciences (RAS), Siberian Branch, Russian Federation, tnp@iszf.irk.ru

Dr. Vasily Pulyaev

Institute of Solar-Terrestrial Physics, Russian Academy of Sciences (RAS), Siberian Branch, Russian Federation, vasily_p@iszf.irk.ru

ARE THERE ANY OSCILLATIONS OF SOLAR ORIGIN IN THE SOLAR WIND?

Abstract

We searched for possible indications of connection between plasma velocity oscillations observed in the region of solar coronal holes and magnetic field oscillations recorded in the interplanetary medium. As a basis, data of observation of solar oscillations in ferrum spectral line in a coronal hole were taken. Measurements were carried out at Sayan Solar Observatory. The high-velocity solar wind flux out of the coronal hole reached the Earth's orbit approximately in 60 hours. Spectra of solar oscillations were compared with those of ultralow frequency (ULF) oscillations of the interplanetary magnetic field (IMF) in the libration point L1. The oscillations were recorded with ACE when the rise-up portion of high-velocity flux carrying an heightened energy of ULF waves reached the Earth. The spectra of solar oscillations had the sharp peak at about 3.4–3.6 mHz. The spectrum of the solar wind ULF oscillations is much more composite, and it is formed by different sources. nevertheless, ULF oscillations of IMF had the peak close in frequency to that of solar oscillations. The analysis of spectra of ULF waves observed in the rise-up portions of 92 high-velocity fluxes confirmed the presence of 3- and 5-min oscillations in the total wave spectrum. As emphasized, the results can not be an argument for direct correlation between solar oscillations and ULF waves in the Earth's orbit but they confirm its possibility. We need an additional research including calculations of trajectories of ULF waves.