EPSC Abstracts,
Vol. 2, EPSC2007-A-00122, 2007
European Planetary Science Congress 2007

Quasi-periodic modulations of the Saturnian Kilometric Radiation and their relation to varying solar wind parameters

M. Panchenko (1) , H.O. Rucker (1), M.L. Khodachenko (1), A.G. Kislyakov (2), U. Taubenschuss (1)

(1) Space Research Institute, Austrian Academy of Sciences, Graz, Austria, (2) Lobachevsky State University, Nizhny Novgorod, Russia (Mykhaylo.Panchenko@oeaw.ac.at / Fax: +43 316 4120 690 / Phone: +43 316 4120 622)

We consider possible connection between modulations of the SKR radio emission recorded by Cassini RPWS instrument and varying solar wind parameters measured by different spacecraft. “Sliding window” Fourier analysis and nonlinear Wigner-Ville transform have been applied. The data sets from Cassini-RPWS (SKR radio emission measurements), Cassini-CAPS (solar wind plasma measurements), Cassini-MAG (magnetic field), Ulysses-SWOOP (solar wind plasma measurements), Ulysses-VHM/FGM (Vector Helium Magnetometer/Flux Gate Magnetometer), and Wind SWE (Solar Wind Experiment) experiments were used. The analyzed SKR time profile has been produced by integration of the Stokes parameters spectra of the SKR over frequency range from 20 to 1000 kHz. Profiles of the solar wind parameters measured by Wind and Ulysses were projected onto Cassini orbit by means of an MHD simulation of the solar wind evolution between 1 and 9.5 AU. Performed study confirms strong correlation between solar wind plasma parameters and SKR and shows evident existences of 7-8, 9-10, 12-13 and 25-27 days modulation lines in the spectra of the SKR and solar wind profiles. These modulations are very likely to be manifestation of the typical periodicities in the solar surface magnetic activity.