Geophysical Research Abstracts,
Vol. 11, EGU2009-12339, 2009
EGU General Assembly 2009

Statistical study of type III solar radio bursts using Wind and Stereo observations : Changes in the emission process below and above 1 MHz ?

A. Zaslavsky, X. Bonnin, M. Maksimovic, and S. Hoang
LESIA, Observatoire de Paris, 92190 Meudon, France (arnaud.zaslavsky@obspm.fr)

The type III solar radio bursts are generated by the propagation along open magnetic field lines, from the low solar corona up to 1 A.U. or more, of suprathermal electrons usually correlated with solar flares. Along their path in the interplanetary medium (IPM), these electrons trigger intense Langmuir waves which are in part converted into radio emission at the fundamental (F) and/or harmonic (H) of the local plasma frequency.
The quite high number of such events observed, particularly during periods of intense solar activity, enabled us to perform a statistical study on more than 1000 Types III events recorded by the radio recievers S/WAVES and WAVES on the STEREO and WIND spacecrafts.
The results presented focus on the frequency dependence of the measured time profiles. In particular, we show that the 'average' type III radio burst presents a maximum of emissivity at around 1MHz, and that its duration increases as the frequency of observation decreases.
Using classical solar wind density models and observed frequency drifts, we obtain a distribution of the electron beams velocity, and their dependence on the distance from the Sun. The result obtained is that the beams are decelerated in the corona until approximately 6-8 solar radius, altitude which corresponds to an emission at around 1MHz, and then propagate at an almost constant velocity in the IPM.