EPSC Abstracts,
Vol. 2, EPSC2007-A-00113, 2007
European Planetary Science Congress 2007

High sensitive and high resolution investigations of the Jovian S-burst emission modulation features

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In spite of the long history of studying, the Jovian S-burst radiation still represents an event which needs to be investigated in detail. Many questions concerning this complex phenomenon are opened. One of the interesting problems is the different modulation features appearing on the dynamic spectra in dependence on the time resolution achieved in the experiment and also on the visualization time scale. It seems that in every concrete case the physical mechanism of the modulation is different. In connection to this the following statistical sets need to be fully collected and analyzed for each modulation effects: 1) observed conditions: dependence or independence on Jupiter - Io - observer position, season time, day-night time, the Solar activity; 2) observed parameters: sign and value of the frequency drift, lane's curvature, modulation depth, distances between the nearest lanes and their variety, scale of the modulation; 3) polarization properties. During the last years the new high sensitive recording facilities, such as the digital spectro-polarimiter (DSP) and waveform receiver (WFR) were created and installed into the largest decameter band antenna array UTR-2 (Kharkov, Ukraine). It can be noted that in the present time this combination (antenna + equipments) gives the best sensitiveness, band of analysis, dynamic range, time and frequency resolutions. The using of mentioned above technique allowed detecting new time-frequency features of the Jovian S-bursts. Several bright new results concerning the modulations were obtained. With the creation of new giant low frequency antenna array (LOFAR) and low wavelength array (LWA) the new possibilities of high level study of the Jovian DAM emission will appear. For instance, the combination of LOFAR and already existing instruments (max base in order of 2000 km) will permit to

determine the spatial parameters and localization of an emission source. Future results may prove useful for the general understanding of the still unclear origin of the sporadic Jovian decametre emission.