Jovian decametric emission observations: New data from the LWA1 and 50 years of older data from the UFRO

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We present new results in the study of Io-controlled Jovian decametric emission obtained using the newly commissioned Long Wavelength Array Station 1 (LWA1). The LWA1 is a low frequency radio interferometer operating in the frequency band between 10 and 88 MHz. The array consists of 256 dual polarization dipole stands, and observations are possible with up to four simultaneous beams, each of which has two independent tuning frequencies. The LWA1 is well suited to studying details of Jovian phenomena due to its high sensitivity as well as high time and frequency resolution over a wide bandwidth. We present LWA1 observations and initial analyses of Io-A/C, Io-B, and Io-D events, including many spectral features such as S-bursts, narrow-band events (N-bursts), as well as modulation lanes and Faraday lanes.

Also, we will present the latest calculation of Jupiter's decameter rotation period using 50 years of data from the University of Florida Radio Observatory (UFRO). We measured the rotation period of Jupiter's inner magnetosphere using 50 years of observations (1957-2007) of the Jovian decametric radiation at the UFRO at frequencies between 18 and 22.2 MHz. The new rotation period is the weighted mean of 23 independent 24-year average determinations of Io-independent radio emissions. Each rotation period was found by measuring the drift of the histogram of occurrence probability versus System III (1965) central meridian longitude over an interval of approximately 24 years. The measured drift was used to correct the System III (1965) period to obtain the new value. Our weighted mean is 9 hours 55 min 29.686 s, with a standard deviation of the weighted mean of 0.007 s. This new rotation period is statistically significantly shorter than that of the System III (1965) value, and is also different from other recent determinations using different techniques. Our measurements indicate an upper limit on any possible Jovian rotation period drift and on other long term changes of the decameter radio sources.