

Jupiter's decametric Io-C modulation lanes observed by LWA1 (2)

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The Long Wavelength Array (LWA) is a low-frequency radio telescope designed to produce high-sensitivity, high-resolution images in the frequency range of 10-88 MHz. The Long Wavelength Array Station 1 (LWA1) is the first LWA station completed in April 2011, and is located near the VLA site in New Mexico, USA. LWA1 consists of a 256 element array, operating as a single-station telescope. Each LWA1 beam provides dual orthogonal linear polarizations such that it is possible to reconstruct the full Stokes parameters for each tuning. The first Jupiter radio observation using LWA1 was made by Tracy Clarke (PI) from December, 2011. The initial analyses of Io-A/C, Io-B, and Io-D event, show many spectral features such as S-bursts, narrow-band events (N-bursts), as well as modulation lanes and Faraday lanes.

The modulation lanes in Jupiter's decametric radiation, which were discovered by Riihimaa [1968], are groups of sloping parallel strips of alternately increased and decreased intensity in the dynamic spectral plots. We present LWA1 observations of modulations lanes detected across a Jovian decametric Io-C burst that contains both right hand circular and left hand circular emission. The modulation lanes cross both handedness of polarization, suggesting that the emissions may be coming from the same hemisphere. These results add important information regarding the emission mechanism of Jupiter's decametric emissions.

Keywords: Jupiter radio, decametric wave, modulation lane, radio source, radio emission mechanism, LWA1