The Long Wavelength Array (LWA) is part of a new class of large-low frequency interferometric telescopes. The complete LWA will consist of more than 50 phased array "stations" distributed over a roughly 400 km diameter region in New Mexico. Each station will consist of 209 pairs of dipole-type antennas whose signals are formed into beams, with outputs transported to a central location for high-resolution aperture synthesis imaging. The resulting image sensitivity is estimated to be a few mJy with a resolution of 8" to 2" (30 to 80 MHz).

Phase 1 of the LWA is nearly complete, with completion of PDR, construction of the first full station (LWA-1) in 2009-10, and operation as a stand-alone instrument in 2010. Utilizing modern FPGA computing, LWA-1 will form four independent (in frequency and pointing) beams on the sky, and provide instantaneous bandwidths of 8 MHz per beam, spectral resolutions down to 100 Hz, and temporal resolutions down to 0.5 ms in the range of 10 to 88 MHz. Signals from 212 dipole antennas will be digitized without frequency conversion (a homodyne receiver architecture), allowing direct beam formation of the entire LWA bandwidth. As the station will operate as a fully electronic phased array, very little repointing time is required. This will allow the beams to be cycled rapidly among many calibration sources on millisecond timescales. This scheme could provide real-time calibration of the turbulent ionospheric conditions, which limit both resolution and sensitivity at low frequencies.

The LWA Project is funded through a contract from the Office of Naval Research to the University of New Mexico. Partnering with UNM are the Naval Research Laboratory, Virginia Tech, the Jet Propulsion Laboratory, Los Alamos National Laboratory, and the University of Iowa. Basic research in radio astronomy at the Naval Research Laboratory is supported by 6.1 base funding.

**Abstract**

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