

SITE SELECTION FOR THE LONG WAVE ARRAY

Price, R.M.,

Department of Physics and Astronomy, University in New Mexico

The Long Wave Array (LWA) will consist of approximately fifty stations arranged geographically so as to optimize u-v coverage and to allow baselines of up to hundreds of kilometers. Each station will consist of an array of 256 crossed dipoles within a diameter of approximately fifty meters. The LWA will have a core of 25 dishes in a five-kilometer diameter circle. The inner kilometer will be densely populated enough with stations and equipment so as to require its own (non shared) land. Other stations each will be contained within a 70-meter diameter fenced area (approximately one acre). Observational frequencies will be 30 to 90 MHz.

From an economic and construction point of view station sites must be available, or obtainable at reasonable cost and/or effort, accessible by road, and close to power and fiber. The economics of each of these points must be considered. Concerns and needs of residents in the area of the station must also be taken into account.

From a technical point of view, the radio spectrum usage environment (generally called RFI by radio astronomers) must be well understood. The LWA and the SKA both require an extensive set of RF measurements at typical station locations. Typically RFI is measured as received power vs. frequency and percent channel occupancy vs. frequency. These measurements should be taken for typical 24-hour periods during both workdays and weekends. Additional measurements will measure diffraction propagation over mountain ranges separating the array stations from major transmitters. Effects of weather and vegetation are also being measured.

Since the ionosphere will contribute considerably to observational data at such low frequencies, it is necessary to know the structure of the ionospheric total electron content and variations on a scale of tens of kilometers. This will be accomplished by careful reduction of existing 300 MHz and 74 MHz VLA observations to obtain optimum imaging. The calibration data obtained from the observations will relate to the ionospheric conditions at the time of the observations.

Abstract Submission Form

2004 National Radio Science
Meeting

Abstract: price7695

Date Received: September 24, 2004

1. (a) Marcus Price
Department of Physics and Astronomy
University in New Mexico
Albuquerque, NM
87131 USA
rmprice@as.unm.edu
- (b) 505 277 4742
- (c) 505 277 1520
2. J - Radio Astronomy
3. (a)
4. C - Contributed Paper,
Program chair: Perley
5. No special instructions