

SITE SELECTION FOR AN ARRAY OF WIDELY SEPARATED RADIO TELESCOPES

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As part of the EVLA Project NRAO is currently identifying sites for a new interferometric array of radio telescopes, known as the New Mexico Array (NMA), intended to increase the spatial resolution of the VLA. Some of the experience gained in this work may be of use for planning the Square Kilometer Array, which will face many of the same site selection issues as the NMA.

The NMA is an array of ten telescopes surrounding the VLA at distances of 50 km to 250 km from the VLA. One of the telescopes, the VLBA telescope at Pie Town, already exists. Wide bandwidth data from each of the NMA telescopes will be sent via a fiber-optic network to the VLA site for correlation with each of the 27 VLA antennas. With a requirement for a total network fiber length of approximately 1400 km, and a fiber cable installation cost of approximately 20 \$/km, it is not economically feasible to install our own fiber. The array must be designed to use existing fibers owned by commercial communication companies. This consideration has a major impact on the selection of NMA sites. Negotiations with commercial companies have shown that the most economic way to establish the NMA network is to lease "dark fibers" from the companies and to use NRAO-owned equipment to transmit and receive the wide bandwidth data.

In order of decreasing importance, the factors that we have found important in selecting NMA sites are as follows:

- Accessibility to optical fiber
- Imaging performance of the array configuration
- Accessibility to commercial electrical power
- Radio frequency interference issues
- Land availability and suitability
- Environmental impact issues

For the last four of these considerations there is no substitute to making visits to prospective sites to obtain a correct impression of the feasibility of the site. Visits to prospective NMA sites resulted in significant relocations of most of the sites due to one or more of these concerns.

Details of some of these issues will be presented during the talk, as will some of the costing information that has been developed.