RF Noise Measurement Program in Support of the Australian Bids to Host LOFAR and SKA

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ABSTRACT

A number of nations are preparing proposals to host the Square Kilometre Array (SKA). The International SKA Steering Committee (ISSC) has defined a set of criteria against which siting proposals should frame their submissions. Unsurprisingly, radio quietness is a critical criterion. The ISSC has recently agreed that, in support of their final submissions, all proposing nations will be required to complete a set of internationally-supervised standardised rf noise measurements with prescribed equipment for their nationally representative site.

Unfortunately definition of the measurement protocol came after initial national rf noise measurement programs had been carried out by a number of nations, including Australia, bidding to host SKA and LOFAR. Results from the initial Australian rf noise measurement program played a major role in the announced selection of the Western Australian site, on technical merit, for LOFAR. However, when initial national submissions were reviewed for SKA siting at the SKA Workshop in Geraldton WA in September 2003, it became clear that cross-comparison of national rf noise measurement results was difficult because of variations in measurement protocols and equipment. This prompted the ISSC to propose common protocols and equipment: the process of reaching agreement on this standardisation is now well advanced, in the lead-up to final national siting submissions due in 2005.

In this paper a report will be given of measurement programs undertaken for the initial Australian siting proposal at three sites, with an explanation of the rationale and approach taken to measurement in the absence of then-agreed standards. These measurements confirm expectations of the extremely low rf noise environment Australia offers. The paper will go on to describe proposals for measurement protocols and equipment to be adopted by the ISSC in its program of international standardised comparative tests.