



The GMRT Archival Data Processing Project

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Abstract

The GMRT Online Archive houses over 80 terabytes of interferometric observations obtained with the GMRT, since the first public observing cycle in 2002. The utility of this vast archive of raw UV visibilities, likely the largest of any Indian telescope, can be significantly enhanced if first look (and where possible, science ready) processed images can be made available to the user community. We have initiated a project to pipeline process GMRT images in the 150, 240, 325 and 610 MHz bands. The SPAM pipeline developed by Huib Intema is being used for this purpose.

The thousands of processed continuum images that we will produce will prove useful in studies of distant galaxy clusters, radio AGN, as well as nearby galaxies and star forming regions. Besides the scientific returns, a uniform data processing pipeline run on a large volume of data can be used in interesting ways. For example, we will be able to measure various performance characteristics of the GMRT telescope and their dependence on waveband, time of day, RFI environment, backend, galactic latitude etc. in a systematic way. Since the SPAM pipeline also carries out direction dependent modeling of ionospheric phase errors, we will also be able to measure differential ionospheric phase delays over thousands of sightlines over the entire solar cycle to better understand the properties of the earth's ionosphere.

The pipeline has currently been run on 8 cycles of GMRT data and more than 3000 images have been produced. Initially run on a cluster of 27 nodes, a second cluster with 28 nodes has now been acquired to run the pipeline on all remaining GMRT cycles. A variety of data products such as calibrated UVFITS data, sky images, Hierarchical Progressive Survey (HiPS) images, PyBDSF catalogs and AIPS processing logs will be delivered to users via the NCRA Archive and Proposal Management system (NAPS). Data products will be compatible with standard Virtual Observatory protocols.