



Title: Upgraded Frequency Standard for the GMRT Observatory

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Abstract :

An Active Hydrogen Maser (AHM) unit was recently procured and installed at the Giant Metrewave Radio Telescope (GMRT) observatory. The ultra low phase noise and stability characteristics of this AHM will facilitate the observatory to carry out Very Long Baseline Interferometry (VLBI) observations. The outputs from the AHM will be used as precision frequency reference for the GMRT signal processing receiver chain particularly for synchronizing sampling clocks for the digitizers and as a reference to the computing cluster.

The AHM is housed in a room, specifically designed considering the environmental parameters such as ambient temperature, mechanical shock and vibrations, magnetic and RFI shielding. Continuous monitoring and remote logging of ambient room temperature, current requirement as well as other vital AHM parameters is being carried out using tools developed in-house. The software tools are also developed to record the phase data between the GPS disciplined Rubidium oscillator and AHM to compare and understand the stability parameters.

To understand the long term characteristics and behavior of the AHM, collaborative effort is initiated with the two Institutions - ISTRAC-ISRO and NPL. Through this collaboration, we would be able to characterize our AHM using form a common view satellite system for performing three-corner hat stability measurement tests.

This presentation will explain the acceptance test carried out at the factory for compliance of the AHM specifications, post-installation tests and benefits to the observatory in terms of observational data. Also, the presentation will walk-through the future plan and collaboration with other Institutes within India for the performance evaluation of AHM.