



## Digital signal transport system for uGMRT

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The Upgraded GMRT provides near seamless frequency coverage from ~ 125 MHz to 1500 MHz with instantaneous bandwidths of up to 400 MHz using state of art technologies used for the front end electronics, signal processing systems, and monitor and control systems. The fiber optic signal transport system is an important part of a radio observatory. The GMRT observatory uses analogue fiber optic link to transports the radio astronomical signal from antenna base to the central electronics building for further signal processing. This report presents a digital fiber optic link for remote antenna application using wavelength-division-multiplexing (WDM) technique over a single fiber to co-exist with existing upgraded GMRT signal transport system and the legacy system of the GMRT. The network architecture is designed with low complexity, low cost and commercially available Ethernet transceiver modules. At each antenna base two polarizations are digitized and transported over 10GbE fiber optic link to the central electronics building. Additional wavelength is used to support the clock synchronization scheme of GMRT. Over the same single fiber a third wavelength is used for the remote antenna control and monitoring application. The overall signal transport system on single fiber supports 8 X 10GbE link to any remote antenna in the array.

At the end, the paper presents the remote post and real time processing of astronomical data at Pune University located at a distance of 100kms using a high speed DWDM based 40GbE link established between the GMRT observatory and the NCRA TIFR Pune using the dark fiber of BSNL dedicated to GMRT.