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Author: Mr. Dominique INGALA  
South Africa, dominiquei@dut.ac.za

DEVELOPMENT OF A MULTI-FREQUENCY INTERFEROMETER TELESCOPE FOR RADIO  
ASTRONOMY (MITRA)

**Abstract**

This paper describes the development of the Multi-frequency Interferometer Telescope for Radio Astronomy (MITRA) with specific regard to the station located at the Durban University of Technology (DUT). The MITRA telescope is a two element interferometer with one element located at the Durban University of Technology in South Africa and the second element located at the University of Mauritius. The telescope is specified to operate over the frequency range of 200 – 800 MHz in steps of 50 MHz with a 10 MHz bandwidth. The paper describes the design of the Dual Polarized Log Periodic Dipole Antenna (LPDA) array which consists of two banks of 8 antennas combined to form a local interferometer. The design of the analog front-end, and digital back-end are also described. The front-end up-converts the received signal to an intermediate frequency for good image rejection while the back-end multiplying correlator is implemented in a Software defined Radio (SDR) architecture using a Universal Software Radio Peripheral (USRP).