



MeerKAT

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Extended Abstract

The first phase of the MeerKAT radio telescope [4] has been installed on the Karoo site. This phase includes all 64 antennas fitted with L-band receivers and digitizers, signal and data transfer systems, time and frequency reference, the correlator/beamformer hardware, control software, and science data processing hardware and software. Not all of the functionality required to execute the eight large scale projects (LSPs) that have been prioritized is available at the moment, but commissioning and test observations have been conducted using the L-band receivers and the first correlator/beamformer firmware releases. Test images of the Galactic Centre, the Galactic Plane and deep extragalactic fields indicate that all of the telescope subsystems are functioning correctly, and specifically that the analog and digital signal paths (including the dish optics) are operating within specification. The sensitivity of the L-band instrument is twice that initially specified in the call for large survey projects [1].

The first astronomy journal article based on MeerKAT observations has been published [2], and a radio flare associated with a black hole transient source has been detected by MeerKAT and reported as an ATEL [3]. Further science articles based on the initial MeerKAT observations are in the pipeline. The telescope digital back-end allows the connection of user-supplied equipment, and pulsar, radio transient and SETI instruments are currently being installed and commissioned.

A technical overview of the MeerKAT subsystems will be given, along with the the latest implementation status and roll-out plan of MeerKAT functionality. Scientific results that have been obtained at the time of the meeting will be presented, and the envisioned schedule for MeerKAT observations will be discussed. In due course, MeerKAT will be integrated into the SKA-mid telescope, and the planning and implications of this integration will be discussed.

References

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- [2] F. Camilo, et al, “Revival of the Magnetar PSR J1622-4950: Observations with MeerKAT, Parkes, XMM-Newton, Swift, Chandra, and NuSTAR,” *Astrophysical Journal*, **856**, 1, April 2018, pp. 180–190, doi:10.3847/1538-4357/aab35a.
- [3] R. Fender, I Heywood, P. Woudt, and J. Miller-Jones, “MeerKAT detection of H1743-322 at 1.3 GHz,” *Astronomer’s Telegram*, **12046**, 19, September 2018.
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