

SINGLE-DISH BACKEND FOR AFRICAN VLBI NETWORK USING CASPER HARDWARE

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The African VLBI Network (AVN) project aims to build radio astronomy competence in African partner countries in preparation for the SKA, but also to improve UV coverage by combining with the European VLBI Network (EVN) to close the gap between Europe and Hartebeesthoek. The first AVN telescope in Kuntunse, Ghana, was inaugurated in August 2017, and currently supports radio astronomy education by providing a platform for students from African countries to perform simple methanol maser observations at 6.7 GHz. Fringe-tests with EVN telescopes have been successfully performed, though the site requires the addition of timing-and-frequency reference hardware before it can contribute regularly to VLBI observations. The single-dish backend (SDB) deployed at Kuntunse is based on ROACH hardware, loosely borrowing from KAT-7's F-engines, and the ingest software interfaces with the station's control and monitoring system to collect all the observation metadata required in order to create neatly packaged observation data files in HDF5 format, to be used with software tools developed at SARAO. A planned upgrade would replace the ROACH with ROACH2, sampling the incoming signal at 1024 MHz, to coincide with the band used by the proprietary DBBC for VLBI, allowing for a great deal of simplification in the receiver. Commensal single-dish observations during VLBI may not be scientifically useful, but it would allow the operator to view the live RF feed in a similar way to single-dish observations, which capability is typically not possible with standard VLBI tools.