January 16, 2023

Effelsberg Station Report

General Status

The 2022 summer maintenance was performed as planned in July/August 2022 last year. Some cabling, anti-corrosion measures and painting of some parts of the dish have been done. A larger project to upgrade the main axis control systems and engines in azimuth and elevation has started. The contract with a company specialized on radio telescopes has been signed and the detailed design study has started. The actual change of the hardware requires an observational stop of several weeks and is currently foreseen for summer 2024. We will try to minimize the downtimes during the regular EVN sessions and the planned eVLBI dates.

Past Sessions

Effelsberg has participated in all observations of EVN Session 1, 2 and 3, 2022. Effelsberg has also participated in all of the e-EVN sessions since the last meeting. Most of the observations were successful. A few might have suffered from bad weather, but only one observation in that period failed, namely ES103B in October 2022, because of a data recorder power failure. Otherwise no known problems.

Current Equipment Status

Effelsberg uses the DBBC2, Fila10G and a Mark6 recorder for all EVN, global, GMVA, and geodetic VLBI observations. Most of the recorded data is e-transferred to the correlators in JIVE and Bonn. In addition there are two NRAO RDBEs connected to one of the Mark6 recorders that are used for observations with the VLBA and HSA. Mark6 modules to Socorro are still being shipped.
The two Mark6 recorders currently provide about 370 TB of disk space in a raid configuration and are mounted as flexbuff mount points. The modules in one of the recorder are mounted as raids, each module of 8 disks forms a raid of type 5. One disk can fail without data loss. One slot is currently kept for modules that can be shipped. This is required because VLBA+Eb and HSA observations that are being correlated in Socorro are now recorded on Mark6 as well. The Mark5C recorder is no longer used.
The Effelsberg Flexbuff storage at JIVE has about 509 TB.

Technical Developments

Effelsberg has started to use the DBBC3 for test observations. A new Field System has been installed that supports DBBC3 operation and a first fringe test during the C-band NME in February 2022 was successful. The full integration is still to be done.
At the same time the project to digitize the direct RF signals of most receivers at the Effelsberg is continued. Until now the general GPU backend can perform polarimetric, spectroscopy, and pulsar measurements. A digital down conversion software for VLBI is in development. As soon as this is realized there will be test to use the general backend for VLBI as well. Currently available receivers are for L-band and S-band observations, the wide-band 4-9 GHz, and an ultra wide band receiver from 1.4 to 6 GHz.