June 21, 2019

Effelsberg Station Report

General Information

Since the last report, Effelsberg has participated in EVN session III 2018, session I, and II 2019 and all of the e-EVN sessions. Most of the observations were successful. Some observations were not observed or had to be stopped in between because of weather (snow, high winds, or thunderstorms).

A wide band C band observations at 4 Gbps was observed with Yebes, Onsala, and Effelsberg with the new DBBC3 backends. Yebes and Onsala used their VGOS antennas and Effelsberg used the linear polarization board band C-band receiver. The fringe test was successful and in the next month it is planned to move to higher data rates.

A new Ku-band receiver was installed in the Effelsberg secondary focus cabin in mid March. It covers a range of 12 to 18 GHz and can provide an IF band width of up to 4 GHz. The first receiver test looked promising with good system temperature and sensitivity and not much RFI. Only frequencies between 12.0 to 12.6 GHz seem to be affected so far. A first fringe test was performed with the VLBA on April 11 and showed strong fringes to Effelsberg. First user experiments were observed with the HSA as well later in April and early May and also there Effelsberg showed good fringes.

Current Status

Effelsberg uses the DBBC2, Fila10G and a Mark6 recorder for all EVN, global, and geodetic VLBI observations. Most of the recorded data is e-transferred to the correlators in Bonn, at the ASC in Moscow, and JIVE. In addition there are two NRAO RDBEs and a Mark5C recorder (SDK 9.2.1) that are used for observations with the VLBA, HSA, and GMVA. Mark5 diskpacks to Socorro are still being shipped.
The two Mark6 recorders currently provide about 290 TB of disk space in a raid configuration (like a flexbuff). The Effelsberg raid at JIVE currently provides only 110TB, but with the planned increase of space at Effelsberg and higher security (see below) it should be possible that data stays longer at Effelsberg and JIVE fetches data only for immediate correlation.

Technical Developments

It is foreseen to build up some Mark6 modules with 8x10 TB disk, so that the disk capacity at Effelsberg can be increased to 450 TB to cover full time 2 Gbps recording in EVN sessions. For safety reasons the new modules should be mounted as raid 5, so that a disk failure should not cause any loss of data.

The VLBA is planning an upgrade to Mark6 recorders in 2019 to allow 4 Gbps recordings and therefore also Effelsberg - as an HSA - station will change the recording of the RDBE data from Mark5C to Mark6 during the next month as well. Because there are two Mark6 recorders, switching between the use of the Mark6 as a recorder for disk module shipment and the use as a flexbuff should not be a problem.

Effelsberg has bought a new maser from T4 science earlier this year. The new maser is currently commissioned and monitored against the old maser. Once the new housing and infrastructure to distribute the timing signals within the institute are being finished the new maser will become the standard time and frequency reference for Effelsberg. The new maser was necessary because the previous (much older) backup maser broke down last year.