Sep. 26, 2018

Effelsberg Station Report

General Information

Since the last report Effelsberg has participated in EVN session II 2018, all of the e-EVN sessions and several out of session observations with RadioAstron. Most of the observations were successful and down times were mainly due to weather (strong wind, thunderstorms or snow fall).

To reduce oscillation of the antenna during scanning mode observations the control parameters of the azimuth and elevation drives were optimised over summer. This has lowered a bit the acceleration of the antenna and therefore position changes over short distances, below about 5 deg, are slower. The maximum speed is not affected by this. The acceleration parameter in the SCHED stations catalogue was updated to the new value.

Current Status

Effelsberg uses the DBBC2, Fila10G and a Mark6 recorder for all EVN, global, RadioAstron, 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. Both VLBI backends and their recorders are controlled by the Field System (current release FS-9.11.19) and use continues calibration at a rate of 80 Hz for the amplitude calibration. The DBBC2 uses the latest DDC (v106, v106e) and PFB (V16_1) firmware and the Fila10G is running firmware v4.1.

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.

On March 21st a new Q-band receiver was installed in the secondary focus. It is a two horn system and provides a tunable frequency range of 33 to 50 GHz with an IF bandwidth of 4 GHz. Commissioning of the receiver is almost finished and the system performance is very good. It provides a two times better SEFD than the old receiver ranging from about 100 Jy at 33 GHz to 150 Jy at 50 GHz. First VLBI fringes were obtained in the global project GG083J, which is not completely correlated yet, but where fringes have been found between Effelsberg and the VLBA at 43 GHz.