

Effelsberg Station Report

General Information

Effelsberg has participated in EVN session III 2016, session I 2017 and all of the e-EVN sessions since the last report, except April and May because of a repair on the azimuth track (details below). Most of the observations were successful. In Session III 2016 a power failure damaged the 5cm receiver shortly before the observations and therefore the LCP channel had an increased T_{sys} that reduced the sensitivity in LCP. The LCP channel of the 7mm receiver is still broken and affected the 7mm observations in session I 2017.

The azimuth rail of the Effelsberg antenna suffered from a crack in the rail which goes back to 2009. A provisional repair worked well, but the foundation suffered over the years and a proper welding became necessary. The azimuth track was repaired from April 5th to May 11th, 2017 and caused operational restrictions. Only a small number of observations could be performed in a limited azimuth range. After Easter the antenna was stowed and no observations were possible until the repair was finished. Since May 11th the observatory started with normal operation again.

Current Status

The new C/X receiver, which provides a continuous bandwidth between 4 GHz to 8 GHz or 5.3 GHz to 9.3 GHz, was successfully used in the e-VLBI observations EO014 in December 2016. The receiver has linear polarization and is therefore not primarily used for VLBI. However, in December the standard 5cm prime focus receiver was not available and the new C/X receiver was used instead. The observations went well and Effelsberg showed good and stable fringes. The correlation and calibration of the data was successful. After the correlation the Effelsberg data was converted to circular polarization using Ivan Marti-Vidals PolConvert program. The program was able to find the cross-polarization gains successfully and applied a correct conversion to all baselines and sources. This is a very promising result as many of the new very broad band receivers will provide linear polarization only.

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 diskpacs 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 continuous calibration at a rate of 80 Hz for the amplitude calibration.

Effelsberg provided beam maps at 6 and 18cm for different elevations to JIVE.

Technical Developments

Technical difficulties in the RF part of the new Q-band receiver delayed the installation in Effelsberg which is now foreseen later in 2017. At the same time a new Ku-Band system should be installed as well, which will cover a frequency range of 12 to 18 GHz. This is not an EVN frequency range, but the receiver will be used for HSA and VLBA+Effelsberg observations.