Onsala Station Report

EVN Session 1/2018

Fringes to the Onsala 25-m radio telescope were found in the NMEs. Because of cold weather at night, the lubricating oil might become sticky to some degree and caused some power-overload errors with the polar motor and requested a manual power cycle to restart the motor. Due to the problem, there were some data loss for a few hours at C bands.

EVN session 3/2017

Fringes to Onsala were found in all the NME experiments. Because of an antenna communication problem, the Onsala 25m telescope failed to observe EC062A partly and the rest C-band experiments (EC061A, EC061B, EC062B, EP103E) completely. After an intensive investigation, it was found out that the problem was caused by a piece of old chip. After replacing the broken chip with a new one, the 25m radio telescope ran smoothly in all the L-band experiments. Because of strong winds, Onsala observed only the first two hours in the last experiment EO107B.

At K band, the users requested to run the observations at ~21.7 GHz. This is lower than the standard VLBI frequency range (22 - 22.5 GHz). Thus, a new LO of 19000 MHz was used to get an IF signal in the range of 512 – 1024 MHz (a request of the IF filter) in this session.

At 8.4 GHz, the continuous calibration system has not been installed yet because of the lower priority.

To avoid the change of the DDC firmwares from E to non-E versions, Onsala is going to use the 2nd DBBC2, which is mainly used for the Geo-VLBI observations for these Astro-VLBI experiment requesting non-E version.

EVN session 2/2017

Due to strong winds, Onsala 25m radio telescope failed to observe EP103C for 8 hours, EP104A and EP104B completely.

e-VLBI sessions

Onsala successfully participated in most the e-VLBI sessions and ToO observations. In the session of Jun 20-21, no observations was due to a broken metal component of the antenna. In the session of Nov 14-15, Onsala failed to finish the session because of a broken polar amplifier.

Status of VLBI backends

During the summer of 2017, the old DBBC2#1 was sent to Bonn to have full Astro-VLBI performance. This service has fixed the problem of bad VSI1 output data stream, which was only output port of DBBC2 V105E mode in the 2Gbps record astronomical observations. Moreover, the FILA10G board was inserted into the DBBC2 box. The change removed the long VSI cables and thus solved the problem with synchronizing 1-PPS signal between FILA10G and DBBC2 in the PFB mode, which supports a maximum of 4/8 Gbps recording rate with FILA10G and Flexbuff. After the maintenance, Onsala can support all kinds of VLBI and eVLBI observations simultaneously with two telescopes. Both DBBC2 can also be work together to support an experiment at a recording rate of 8 Gbps with a clock rate of 1024 MHz or 16 Gbps with a clock rate of 2048 MHz. The Flexbuff is the default recorder for both Astro and Geo-VLBI observations.

Onala has also started to monitor the VLBI data quality with a local script. During the scan gap, we read a slice of scan data and make the plots of BBC bandpass, phase-calibration tones, and sampler statistics. This monitoring plots help Onsala to avoid the improper load of the firmware, LO drift, and sensitivity loss.

Onsala VLBI backends were also used by Ed Himwich to develop new FS functions for the wide-band VLBI observations at 2/4 Gbps recording rate.

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