Onsala Station Report

R&D projects for the near future VLBI observations
(1) A 2L2H DBBC3 or equivalent broad-band backend dedicated to Astro-VLBI observations has been proposed. Currently, it is under investigation.
(2) A new RF-to-IF box for the 25m telescope is under design. This will provide broad-band IF signals to well support future 4-32 Gbps VLBI observations, the more options of filters with improved IF bandpass shapes, and the more friendly control interface.
(3) A new Flexbuff-like computer dedicated to FRB (fast radio bursts) observations and data reduction has just been ordered and installed at Onsala. In the near future, its disk space might be boosted to support broad-band Astro-VLBI testing observations.

EVN Session 1/2020

Fringes to the Onsala telescopes were found in all the NMEs. The FS version 9.13.2 was used. The latest firmware DDC V07beta5 was also tried while crashed after running for a few hours during the e-VLBI session. So, Onsala DBBC2#2 keeps using DDC V107 beta3. It was stable in the session.

Because of strong winds, there were some significant loss: 4 hours in EM117P, 9.5 hours in EK046H, no observations in the last two experiments EP119 and EG109B. The ToO experiment RD001 was skipped due to the late notice of the block schedule v3. The e-VLBI sessions of 2020 Mar and Apr were missed because there was a problem with the antenna stowing system and our engineers were required to work from home during the tough time of COVID-19.

Onsala has required to change the nominal LOs from 6250 MHz to 5900 MHz at 6.7 GHz and from 42.8 GHz to 42.3 GHz at Q band. This will allow the users to have full 512 MHz bandwidth coverage in the 2nd Nyquist zone (512-1024 MHz) of DBBC2 input IFs.

There were still a certain fake clock jumps in the log files because of the unstable PPS output of the local GPS receiver (CNS Clock II). A recent investigation has found a relatively loose connector. It is not clear whether these jumps are indeed related to the connector. Further monitoring will answer this.

EVN Session 3/2019

Fringes to the Onsala 20 and 25m radio telescopes were found in all the NMEs. The latest FS version 9.13.2 and DBBC2 firmware DDC V107beta3 were used.

At X-band, the solid sub-reflector was not used in order to support S/X band observations. At C band, the polarization was swapped in N19C3. The minor problem, found in the afternoon of Friday, was not fixed until the upcoming

Monday.   There was something broken in the C-band IF selection module. To select proper IF output, the manual switch had to be used. There were two power cut-offs on Oct 27 (EM140A) and 28 (EC071B). This caused the loss of the frequency setup. Moreover, there were significant data loss in EM140A and EC071B because of a change of the local network configuration. Due to strong winds, Onsala lost part of the observations in EC070D and EK046C.

Before the session, the noise source at L and C bands was broken. After fixing the noise source, the related calibration rxg files were updated. The IF output of the L-band receiver has been widened by an upgrade of the IF system. Now, Onsala can cover 1.2-1.75 GHz.. The narrow-band 130 MHz RF filter for the standard L-band EVN experiments is still available.

This year, Onsala has also actively tested the new firmware of V107 beta 1-4 by running parallel VLBI observations with the 2nd DBBC2 backend.

EVN Session 2/2019

Fringes to the Onsala 20 and 25m radio telescopes were found in all the NMEs. Due to the high-speed winds, there are three experiments (EH036A, EG100C, RA003) suffered partial failure and two experiments got completely failure (EH036E, EK038D). During these scans of off-source, the data were still recorded.

Onsala data had a certain (~0.1%) packets dropped not only at the beginning of some scans but also during some scans. After some investigations by the local expert Simon Casy, there was no culprit found. After EP113E, the Astro-Flexbuff was rebooted and the minor recording issue was just gone. During the session, we also noticed that jive5ab 2.8.1 might dropped the last packet of each recording scan, which might corresponds to ~3s data at a recording rate of 256 Mbps. Later, jive5ab 2.9 has been installed, tested, and used as the default version at Onsala.

Onsala has used V107 beta3 and FS 9.13.1.rc2 in the session. There were some negative Tsys data and many fake Tsys-overflow events, i.e. $$$$$$, in the log files because of a known firmware bug. So, the log files were a bit of dirty.

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