

Onsala Station Report

R&D activity

A new IF system was built and installed by Ulf Kylenfall et al. before the EVN session 1/2021. The new IF system provides 512-MHz bandwidth IF signals to support normal VLBI observations. Furthermore, it can output 1 GHz bandwidth IF signals for the 8 Gbps observations with DBBC2, and 0-4 GHz IF signals for the future 32 Gbps observations with DBBC3. Because of the new IF system, Onsala has started to use the new LO=730 MHz at L band.

The L-band receiver has been recently upgraded by Lar Pettersson et al. The old LNAs of the L-band receiver have been replaced by two modern LNAs. Because the new LNAs have a noise of a few Kelvins lower, the upgraded receiver has better sensitivity and linearity.

A new control computer was purchased for Onsala to replace the old VLBI FS computer. With the local support by Eskil Varenius and Roger Hammargren, this new FS computer has been intensively used by Ed Himwich to develop and test FS 10 remotely for the future DBBC3 observations. New Flexbuff and broad-band connection to JIVE have been approved by our Director. Together with JIVE experts, Roger Hammargren is investigating the next-generation Flexbuff hardware and the possible upgrade of the network to 8/10+ Gbps.

A local project to develop a backend to search for fast radio bursts has been initiated by Gary Hovey et al. Investigating COTS ADC/FPGA (ADQ7WB) initially for FRB monitoring. The unit has two 12bit ADCs with 6 GHz BW and samples at 5Gsps. Testing is underway with initial results expected by June.

Onsala is currently developing a C/X (4-9 GHz) receiver and a 3-band (22/43/86 GHz) receiver for the 20 m telescope.

EVN Session 1/2021

Fringes to the Onsala 20 and 25m radio telescopes were found in all the NMEs. The FS version 9.13.2 and DBBC2 firmware DDC V107 Beta3 were used. During the X-band only part, the S-band parabola was removed. The session was operated remotely by Franz Kirsten during the X-band part and Jun Yang during the rest parts. There were only a few experiments (EH038A, ET045A, EM148) suffered minor losses due to strong winds. All the e-VLBI sessions between sessions 3/2020 and 1/2021 went successfully.

Jun Yang, on behalf of the Astro-VLBI Group of Onsala Space Observatory