Torun (Tr) Station Report

(Jan 31th, 2016)

Brief Report of Recent EVN Session Problems

There was one (Oct/Nov 2015) EVN session that took place after the previous report (Jun. 23, 2015). In that session, Tr participated in 24 disk-based experiments scheduled at L, C, Methanol and K (one global RA) bands. No known problems occurred with the exception of 50-minute late start of EW017B experiment due to problems with control files.

Outside these regular EVN sessions, in the period Jun. 23, 2015 - Jan. 31, 2016, Tr took part in 304 short-duration (of about one hour each) RadioAstron (RA) experiments and 10 other experiments (e-VLBI, ToO and global RA). Thirty RA one-hour experiments were not observed for various reasons (L-band receiver failure etc.). Tr could not participate in e-VLBI experiment in December due to L-band receiver failure.

Changes/Upgrades Made to Software

Current software versions

- Mark5A OS is Debian "Etch" version 4.0 with the package mark5a_1.0.7-i386.deb
- Mark5A application code is Mark5A2007y.225d
- The StreamStor driver library version is 10.31 (SDK 9.2), with API version 11.25 and firmware version 13.05
- FS 9.10.4 version is used for Mark5A, and 9.11.07 for Mark5B/DBBC.
- Mark5B jive5ab version is 2.7.1-SDK9.2
- The software version of DBBC in the 'tunable' mode is 1.04.2. (During 2-Gbps tests:1.05E.)

Problems with old frequency standard.

Setup and monitoring systems of our EFOS15 frequency standard does not work. Although the maser works fine, we cannot monitor its parameters nor can we adjust its frequency. As a result, maser drift is rising and now is around 1.7 µs/day.

Remote atomic clock delivery to the VLBI station in Toruń

On 26 Nov. 2015 TRAO was connected to the Polish fibre optic network distributing time and frequency (T&F) signals from UTC(PL) and UTC(AOS) laboratories. This paved the way for the investigation of alternative methods of T&F synchronization during VLBI observations. The first proof-of-concept VLBI observation using remote synchronization via

optical fibre link was carried out on 18 Dec. 2015. Data from Tr, Wb, Mc, Ys, and O8 were correlated in real-time (e-VLBI) at JIVE. Additionally, the raw data from the stations were recorded at JIVE for possible further processing. The T&F signals from a remote H-maser, i.e. 1 PPS and 10 MHz, were delivered from UTC(AOS) via cascaded link Borowiec-Toruń (330 km) and Toruń-Piwnice (15 km). To make the comparison of both methods of synchronization possible, the observation began under synchronization from the local H-maser and then shifted to remote synchronization with each segment lasting about an hour. The analysis carried out at JIVE showed that the fringe visibility phase noise is very similar for both synchronization schemes for all four baselines to the Tr over time-scales ranging from two seconds to 45 minutes. The initial success was confirmed in the operational use of the remote H-maser during the e-VLBI session of 12-13 Jan 2016.

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