

Metsähovi station report Q4/2014

EVN TOG meeting – Cagliari

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1) Receiver status

The new 86 GHz receiver has been suffering from instability issues and it will be repaired during 2015. The receiver should be functional at the last end of 2015 at the earliest. The 43 GHz receiver has been out of order for the last years. The receiver with new LNAs is now ready for testing. A fringe test with Effelsberg and Yebes has been scheduled (September 30, 2014). Metsähovi is also included in the EVN session II, 2014, schedule's Q-band experiments. The 22 GHz receiver is working fine. However, in one of the EVN sessions in 2013 LCP's LO oscillated. The problem disappeared after the session before we had time to troubleshoot it. S/X receiver is also functional.

2) BBC/DBBC status

Our old analog BBCs have now been retired. We have switched to using DBBC + Mark5B+ combo in June 2013. We ordered a DBBC from Hat-Lab, and it arrived in September, 2012, with a standalone FILA10G. Fila10G works nicely. A Mark5B+ arrived in Spring of 2012. DBBC works mostly fine with firmware versions DDC v 104_2 and PFB v 14. We have had some issues with the DDC firmware. Sometimes when uploading the firmware something (perhaps related to timing) goes wrong, and the gain readings for BBC 05-08 remain too low when compared to other BBCs. The problem appears to be hardware related. The boards were modified in January 2014 by M. Wunderlich. We have learned that calibrating the DBBC after modification and after changing the firmware is highly important. We still continue to have problems with our DBBC. Over time it goes out of sync. Also sometimes uploading the firmware fails, and the firmware is uploaded in one or several of the Core boards in a wrong way. This results in negative Tsys values for the BBC channels related to the Core board(s) in question.

3) Disk recorder developments

We have developed a new DAQ system, the FlexBuff, using COTS components. Local UDP streaming performance tests : Wirespeed 10GE , Long (30min) tests show writing at max wire speed and 0 packet loss , Writing to 34 disks /wo net, architecture can handle 40Gbps; always >30Gbps. We participated successfully in the NEXPreS 4G demonstration using FlexBuff and Fila10G on September 18, 2013 → fringes!

4) Software versions

We have installed FS 9.11.5, SDK 9.2 and jive5ab 2.5.1. We are using DBBC firmware versions DDC v 104_2 and PFB v 14. We will install the latest FS Linux and FS version 9.11.6. in the near future.

5) Other issues: phase cal and cont cal

Phase coherence tests will be done prior to every session.

Continuous calibration is implemented but not yet tested.

6) Personnel

EVN VLBI Friend of Metsähovi starting from January 2014 is Minttu Uunila (minttu (at) kurp.hut.fi).

7) Mark 5A / Mark5B+ issues

We have fixed our Mark5A 1 Gbps recording problems by changing a resistor (R25 to a 27-ohm one) in the Mark5A I/O board. Mark5A is now only used for testing purposes. We have purchased a Mark5B+ system, which is in use but it had problems with its Bank A which did not work due to a broken StreamStor Amazon card. Mark5B+ is now used with jive5ab instead of DIMino.

Because the Bank A in Mh's Mark5B+ was broken, we used a special version of SSErase from Haystack to enable conditioning in Bank B. After conditioning with it, the modules were left in an unusable condition. Also several Mark5 related errors could be seen each time when using Mark5B+. After switching to jive5ab all the mentioned Mark5B related errors (listed below) disappeared and now we don't have to reboot Mark5B+ every time we change modules. Mh used jive5ab for t2092 in October 2013, and not a single Mark5 related error appeared and we didn't have to reboot Mark5B+ at all during the session. We have used jive5ab ever since.

In October 2013 we loaned a Mark5C Amazon board from MPIfR and uploaded required firmware from Conduant to make it and Mark5B+'s daughter board compatible. Now conditioning and recording in both banks was possible. Mh Amazon board was shipped to Conduant for repair earlier. We got the Mh board back from Conduant at the end of 2012 and tests at Mh show that it appears to work fine now. The problems that occurred with our own Amazon board before switching to jive5ab are listed below.