DBBC3 / DBBC2 COMPARISON

Helge Rottmann / Gino Tuccari



CONDUCTED TEST

Simultaneous recordings with DBBC3 and DBBC2 backends during the GMVA pre-session fringe test `F251A`

Stations:

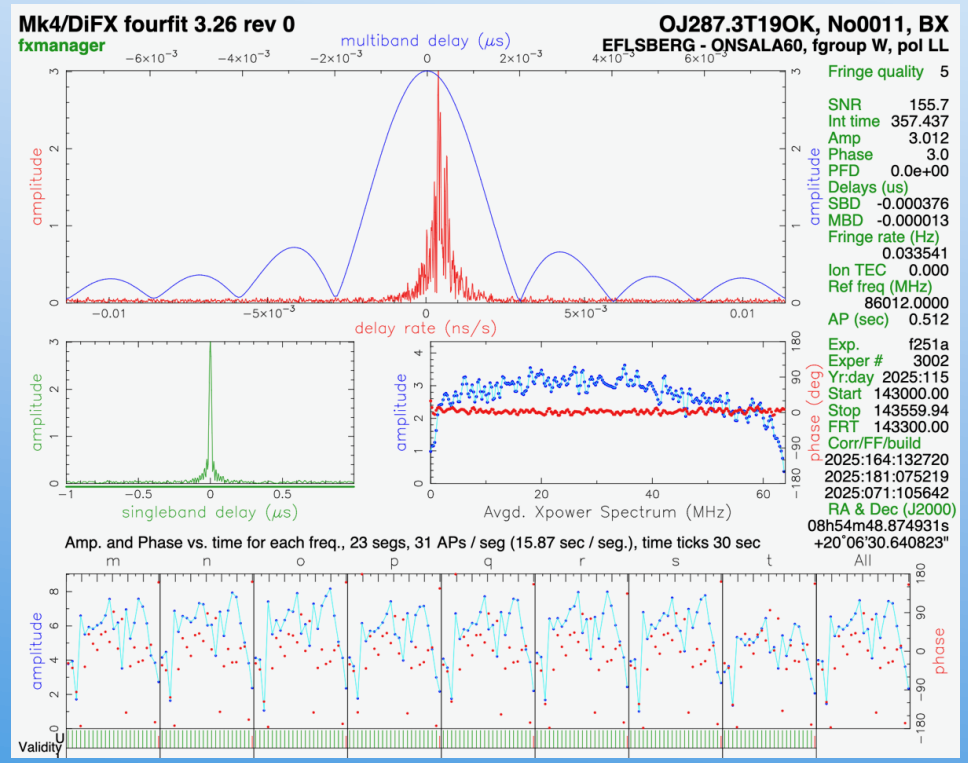
- Onsala
- Effelsberg
- Yebes

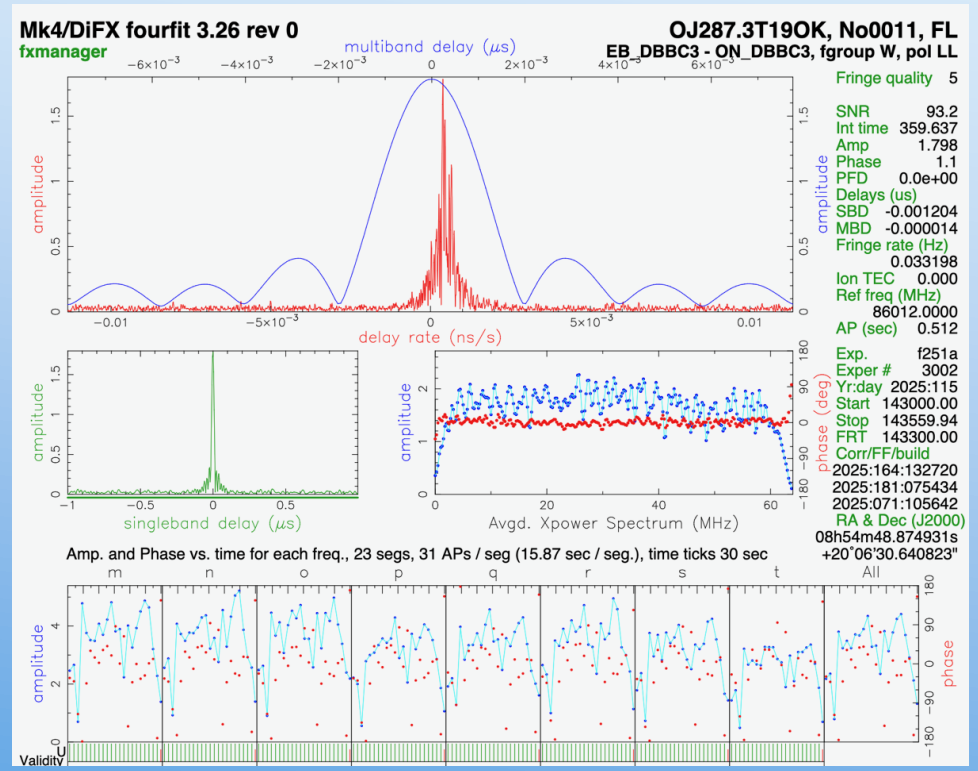
Test was carried out in DDC mode: `DDC_E_128`



EVALUATION

Exemplary result: Effelsberg – Onsala baseline





Overall good agreement but significant difference in cross-power amplitude (and SNR)

Max-Planck-Institut für Radioastronomie

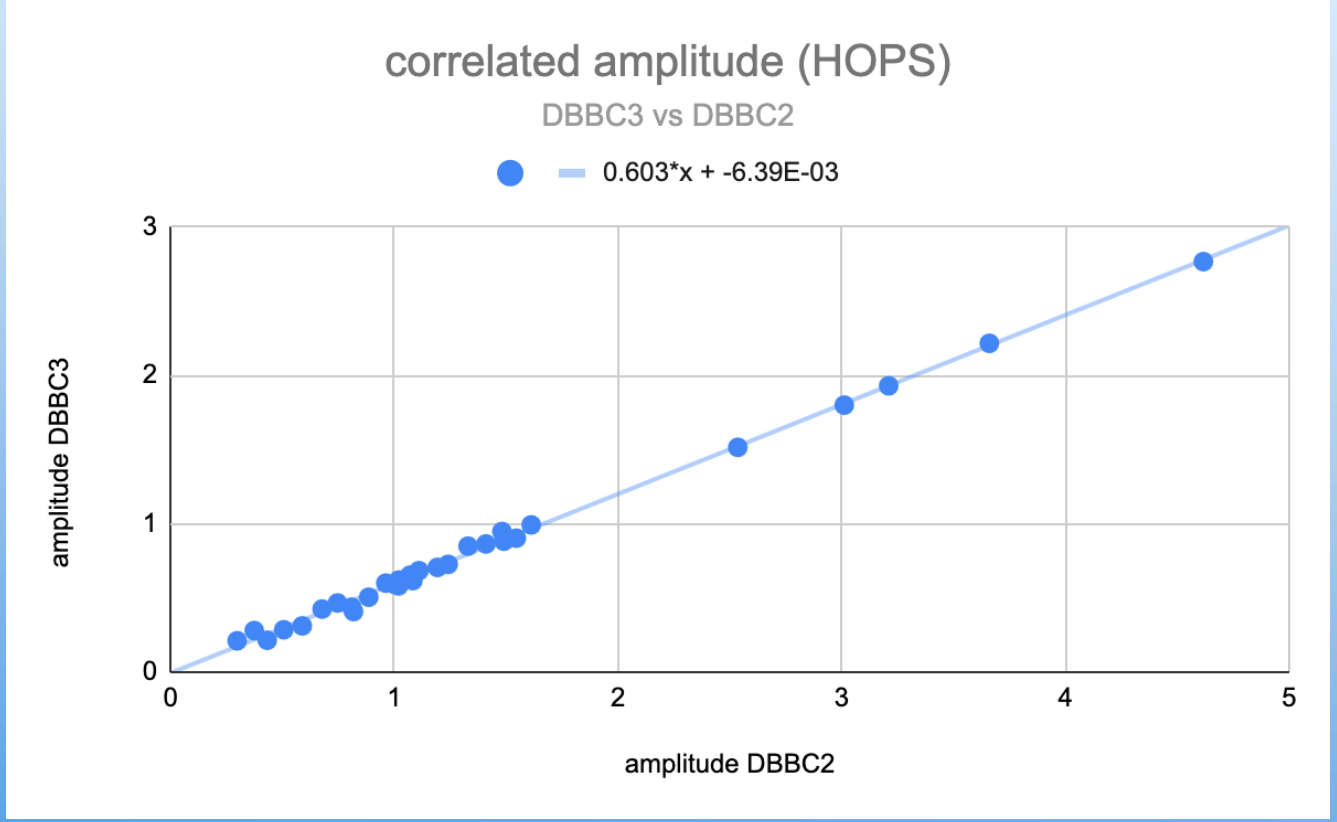
FINDINGS

Comparison of correlated amplitude on all baselines

DBBC2-DBBC2 vs DBBC3-DBBC3

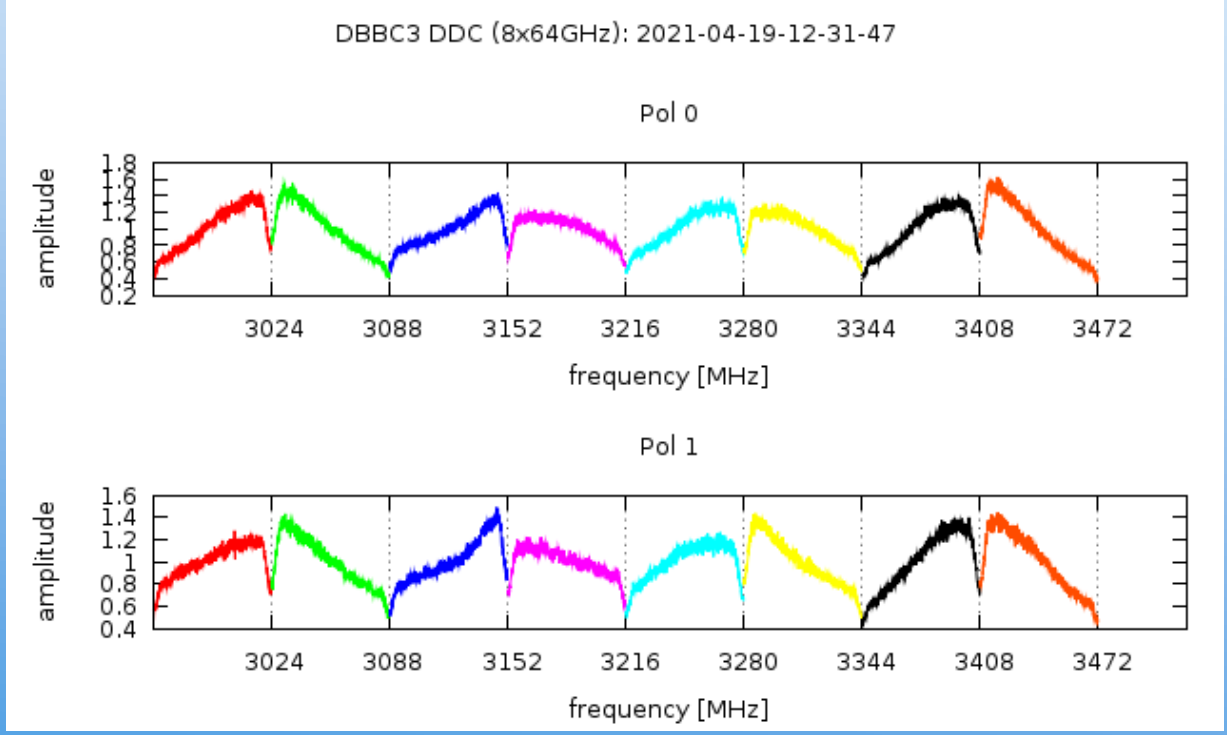
Amplitude (SNR) is consistently lower by 40% on DBBC3-DBBC3 baselines.

Results were reproduced also in AIPS.



Max-Planck-Institut für Radioastronomie

DBBC3 BANDPASSES



Bandpasses @64 MHz

Max-Planck-Institut für Radioastronomie

GINO‘S NOTES TO THE TOG

HAT-Lab is currently developing new firmware for the DBBC3 specifically tailored to the requirements of the EVN VLBI network.

The main objective of this activity is to optimize the DDC versions with the available digital filter in order to provide bandwidth configurations as close as possible to those currently supported by the DBBC2 systems in operational use within the network. Taking into account the hardware resources available in the DBBC3 platform, priority will be given to the bandwidths most commonly used in EVN observations, in particular 64 MHz and 32 MHz.

Testing and validation of these new DBBC3 operating modes are planned to be carried out by the end of 2026.

It is also suggested to test and adopt the already available OCT modes also which provide large bandwidth observing modes with 2-1-0.5 GHz.

Additional bandwidth configurations or specific operational requirements may also be considered.

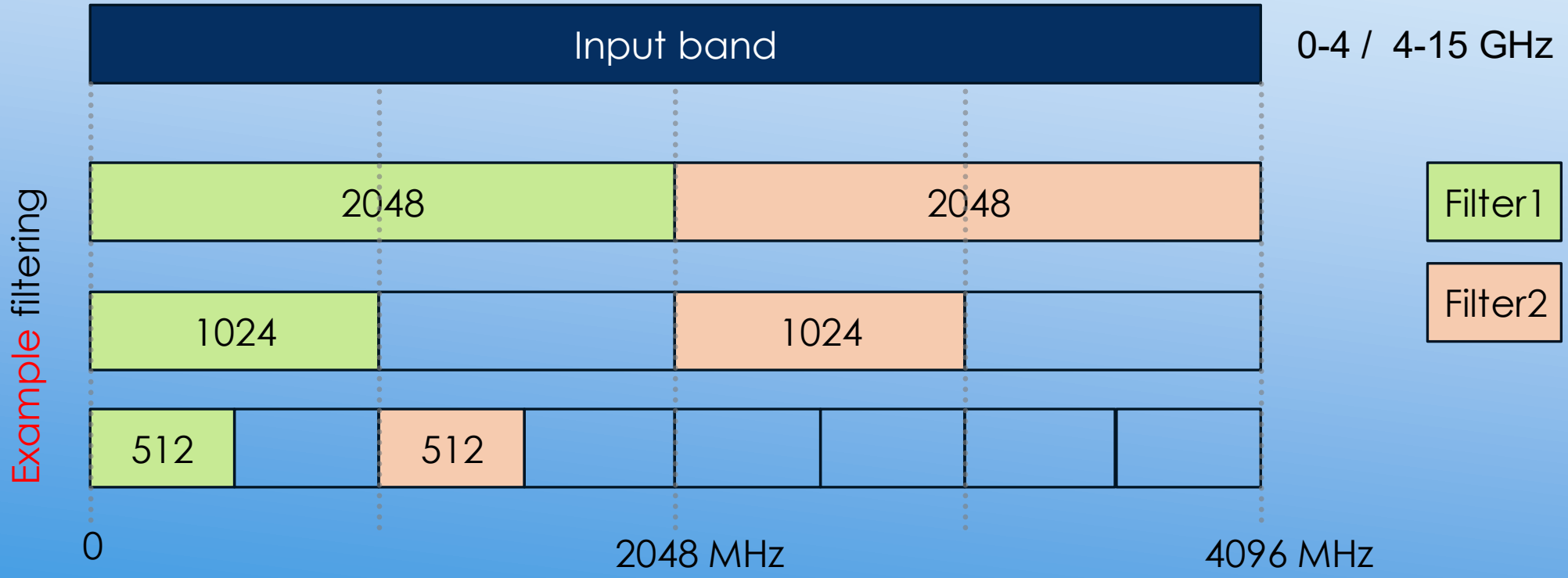
Any further requirements or desired observing modes should therefore be identified and communicated by the EVN working group, so that their feasibility and possible inclusion in the firmware development could be evaluated.

As has traditionally been the case for DBBC development and support activities, this work is being carried out by HAT-Lab in collaboration with MPIfR and IRA-INAF.

Max-Planck-Institut für Radioastronomie

OCT MODE

OCT = filtered mode: 2 filters can be applied at fixed positions (multiples of the filter size) in the baseband.
Filters of different widths exist*: 2048, 1024, 512, 256 MHz



* For filters < 2 GHz consult the DBBC3 FAQ: https://xwiki.mpifr-bonn.mpg.de/xwiki/wiki/vlbiwiki/view/Public%20Area/DBBC3%20FAQ/

Max-Planck-Institut für Radioastronomie