



# Implementation of a geodetic path at the JIVE correlator

M. E. Gomez (1), M. Kettenis (2), P. Charlot (1), R. M. Campbell (2), A. Keimpema (2)

(1) Laboratoire d'Astrophysique de Bordeaux  
(2) Joint Institute for VLBI-ERIC



# JIVE

JIVE (Joint Institute for VLBI ERIC) is the central organisation in the European VLBI Network (EVN).



JIVE support and coordinate operation of the radio telescopes, data processing and correlation, mostly for astrophysics.

It also support research and development of software and hardware and provides science support and training.



# What is JUMPING JIVE?

JUMPING JIVE: Joining up Users for Maximizing the Profile, the Innovation and Necessary Globalization of JIVE.

Project H2020

Partners: 12

Coordinator: Francisco Colomer (JIVE)



Duration: 50 months (from December 2016 to January 2021)

Working packages: 10.



They go from outreach activities to technical aspects (integration of new telescopes, adapting scheduling and monitoring tools, and enabling geodetic use of JIVE data processor).



## JUMPING JIVE WP 6

**Objective:** implement full geodetic capabilities at the JIVE (SFXC) correlator.

\* Properly handling of geodetic sessions which are scheduled with sub-netting. ✓

\* Data Interface:

\* Attach the correlator model to the correlator output ✓

\* Attach phase-calibration information to the correlator output

\* Provide correlator output in appropriate format for further geodetic post processing

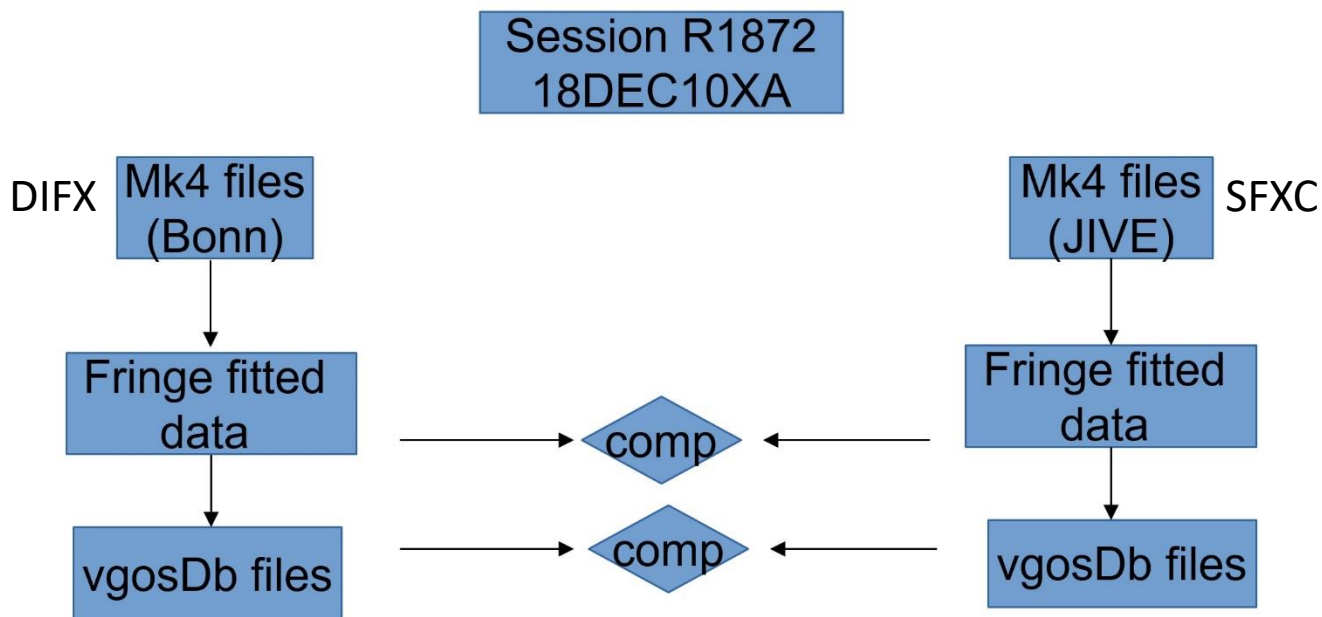
\* **Validation with real data by using an IVS session**



\* Conduct a full geodetic-style observation to address positions of non-geodetic EVN antennas



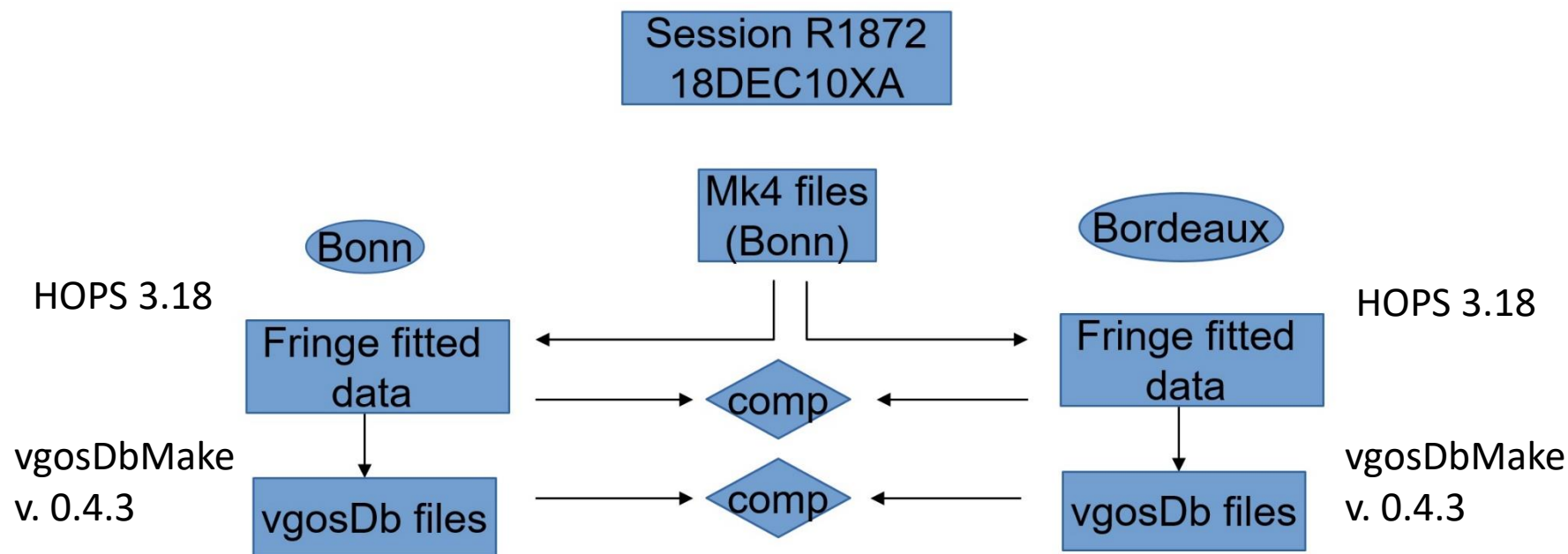
# Validation procedure





# Internal Control of the procedure

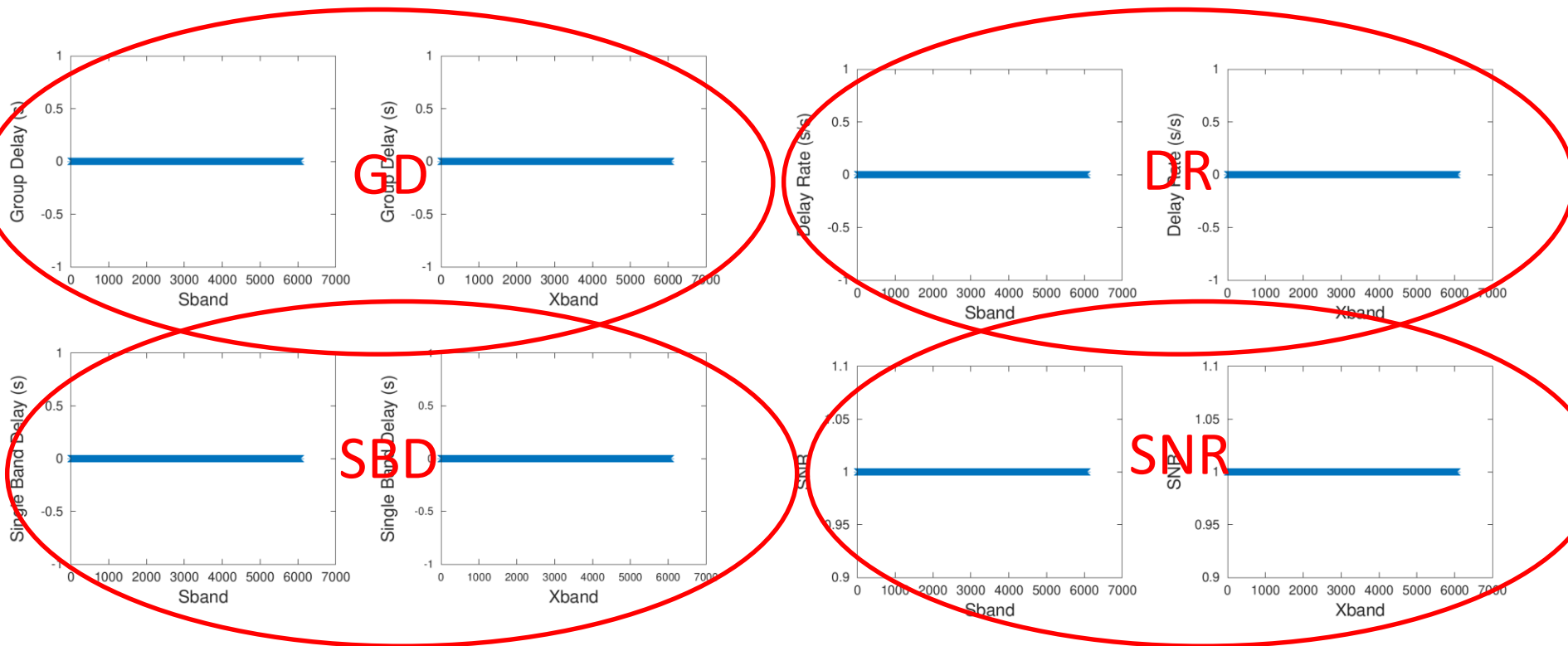
Implementation of HOPS and vgosDbMake in Bordeaux



Goal: to be able to reproduce Bonn results exactly so that the following comparison is not affected by potential differences due to e.g. software version or other issues.



# Results of Bonn successfully reproduced in Bordeaux: vgosDbMake output are identical.



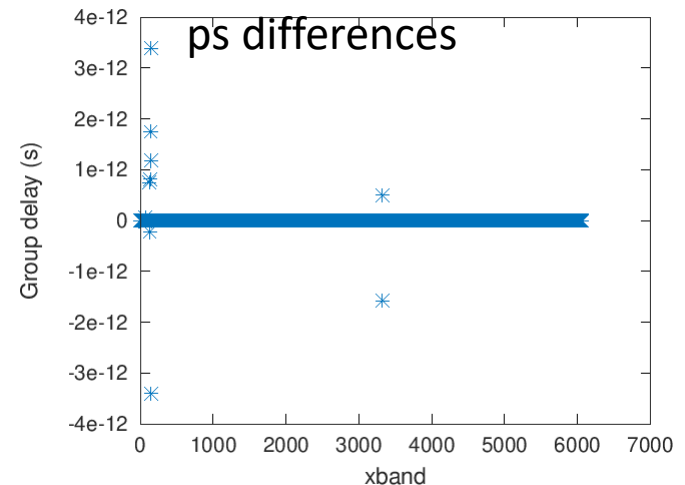
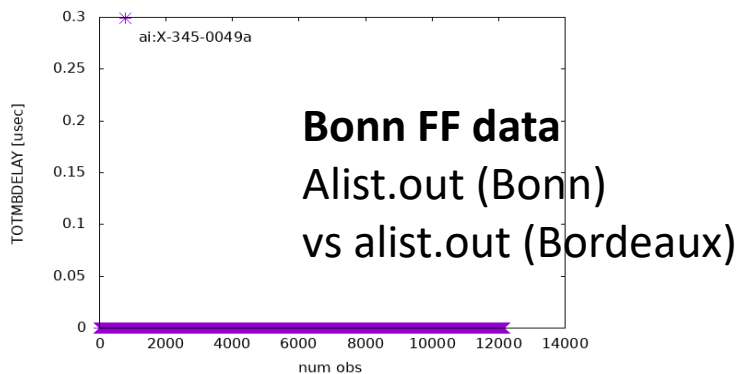


## Some issues related to the software implementation

Even if it was supposed to be straightforward, the comparison of vgosDb files was not.

We found:

- \* One difference between alist.out files in the Total MBD
- \* Differences in phase and other observables due to HOPS version
- \* HOPS 3.17 did not run on this data

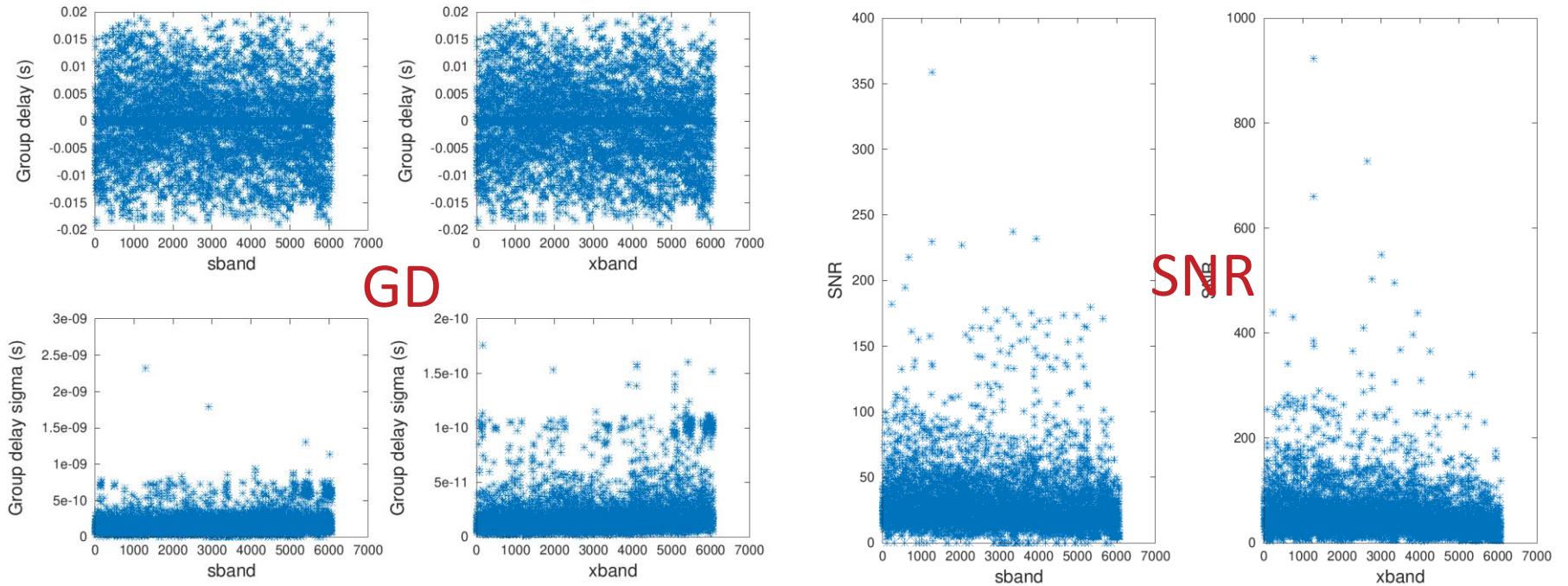








## Extraction of observables from the vgosDb file







# Summary

We are able to produce vgosdb format files from data processed with the JIVE correlator.

SNR was analysed and it shows satisfactory results. We are still analysing the rest of the observables.

A full comparison between the two sets of observables from the vgosDb files will be done and a report will be written.

**Acknowledgement:** the authors would like to thank Laura La Porta and the Bonn group for providing us with the correlated and post-processed data as well as all the auxiliary files.



# Thanks for your attention