

Internal JIVE BlackHoleCam meeting

Date: 20 June 2016, 11:00 in Arpad's office

Subject: pipeline WP

Present: Arpad Szomoru, Des Small, Mark Kettenis, Ilse van Bemmelen

Summary of NRAO visit and EHT response

Des and Ilse have attended the NRAO synthesis imaging workshop in Socorro and had an additional few days to discuss the CASA fringe fitting routine with George Moellenbrock and Jeff Kern. A detailed report on the meeting and a trip report have been circulated separately. The work at NRAO is picking up speed, and there will be a telecon early July to keep track of progress on both sides.

The planning is to have a task fringecal in the CASA 5.0 release, which appears in March 2017. This requires implementation of the C++ code to be complete around the end of this year, as the code freeze for the release is typically one month prior.

A quick one-liner update of this was sent to the team in Nijmegen, upon which Remo forwarded it to the EHT team at Haystack, which instantly initiated a software workgroup. Without asking, Des, Mark and myself were appointed as members, in spite of the very obvious lack of a collaboration agreement between EHT and JIVE. The purpose of the workgroup will be discussed in a telecon this or next week. Ilse will attend as the JIVE liaison to get clarity on the purpose of this group in relation to the work we do for BHC.

In discussion with the team in Nijmegen we have clarified that the work done in JIVE is on a tight schedule, and this does not leave time to meet change requests that might come from the side of EHT.

Development of other VLBI capabilities

Together with Dirk Petry Mark has implemented a tool that reads Tsys values into the MS. After some worries from Anita Richards about axis offsets, it is ensured that this is handled in the correlator and needs no further attention in the post processing. The associated table in the MS is empty, which may be confusing for the users.

Mark made a script that can read the ANTAB table format and add a Tsys table to the FITS-IDI, so the user can forgo the step of adding that table in AIPS, but still needs to add the gain curve manually for now. Next step is to develop the apply step for the Tsys. Implementation of gain curve support requires a proper and consistent definition in CASA. That might take some more time, but for BHC there is a work-around script.

Development of fringecal

Des and Ilse have rerun the AIPS verification tests with uniform settings for all simulations and EVN observations. This will be analysed and reported to the BHC team before the end of this month. A test without the EF station still has to be done.

The next steps are to migrate to a new solver that can be used at C++ level. This migration can be done at Python level, which makes testing and debugging much easier. Implementation of multi-band delay is still pending. This could be a major bottle-neck for the performance of fringecal, and it needs to be able to handle non-consecutive data in frequency and time.

Steven Bourke was visiting last week and was involved in some discussions. He has moved to OSO (Sweden) and is part of the LOFAR long-baselines workgroup. With his expertise and current position, he has been given access to the development repository of our code. We hope he will provide useful insights and contributions, and through him we can keep a close link with the LOFAR long-baseline software team.

Actions

We combine the actions from the report on the NRAO visit and our last meeting into a complete list at the end of this document. Actions labeled "NRAO" are from the report on the NRAO meeting on 9 June 2016. Ongoing actions:

13: get EHT data is shifted to Nijmegen, where they are building their own test environment and have more expertise in handling mm-VLBI data. Ilse received a request from Cornelia Mueller to use the fringecal task for GMVA observations, that is an excellent test case once the Nijmegen environment is up and running. We remove the action from our list.

6: in progress, should be done this month

18: awaiting implementation of multi-band delay

19 - 21: done

22: Mark will ask George if he is OK with publishing this list on a wiki

23: in progress. This document will need to go into the CASA plone documentation server when fringecal is implemented.

24: in progress.

25, 26: done

27: still to do.

| ID | Description | Owner | Ref. | Due |
|----|--|------------|--------|--------|
| 4 | Write note on motivation for solver | Des | 151019 | |
| 6 | Write report on verification with AIPS (deliverable) | Ilse | 151019 | 160630 |
| 12 | Test multiband delay correction | Des | 151214 | See 34 |
| 18 | Process EVN EA054 data with CASA | Mark & Des | 160115 | See 34 |
| 22 | Put up CASA to-do on the SKA-NL/BHC wiki | Mark | 160404 | |
| 23 | Write up phase model for CASA calibration | Des/Mark | 160404 | |
| 24 | Improve delay and rate application | Mark | 160404 | |
| 27 | Include verification test without EF station | Des/Ilse | 160512 | |
| 28 | Plan telecon with NRAO | Ilse | 160620 | 160715 |
| 29 | Attend EHT software WG telecon | Ilse | 160620 | 160629 |
| 30 | Discuss testing environment in Nijmegen | Ilse | 160620 | 160621 |
| 31 | Definition of gain curve in CASA | Mark | 160620 | |
| 32 | Implement apply Tsys for MS | Mark | 160620 | |
| 33 | Migrate fringecal prototype to new solver | Des | 160620 | |
| 34 | Implement multi-band delay in fringecal | Des | 160620 | |
| 35 | NRAO: List of minimum parameters for fringecal | Ilse | 160620 | |
| 36 | NRAO: Define CASA XML template for fringecal | Ilse/Des | 160620 | |
| 37 | NRAO: Verification C++ fringecal against AIPS | Ilse/Des | 160620 | |
| 38 | NRAO: Benchmark fringecal | TBD | 160620 | |
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Next meeting: 14 July 11AM