Internal JIVE BlackHoleCam meeting

Date: 3 March 2015, 13:30 in Arpad's office
Subject: implement fringe finder in CASA, software pipeline WP
Present: Arpad Szomoru, Des Small, Mark Kettenis, Ilse van Bemmel

This is the first actual meeting to start the implementation of a fringe finder algorithm in the CASA package. Des will be the main programmer. Mark is present to give advice, and will start looking at the conversion routines from FITS-IDI to the CASA MS format.

We discuss the current status of the choice of software, and why CASA is preferred. The documents will be put on the BHC internal wiki. Ilse discusses the basic requirements for the algorithm and the two possible options: global fringe fit or baseline based fringe fit. The current packages used for mm-VLBI all have the latter. The main disadvantage is that it has less sensitivity, but this could be overcome by using the baselines to ALMA as an anchor, and then fine tuning the search window of fringe detection on the phase closure triangles. This can be an iterative approach to optimize fringe detection on all baselines in a mathematically consistent and reliable way.

Several attempts have been undertaken to write fringe finder for CASA. Some of the later ones can be of use to us. Neal Jackson (UMan) has provided a Python script to fit only delay for e-MERLIN. Ian Stewart (ALMA – Leiden) has been working on a fringe finder for LOFAR, which uses a combination of global fitting and baseline based. We will invite Ian over to discuss his work in more detail.

Mark brings up the issue of the CASA calibration model: we can find a fringe and fit delay and rate, but where do we store the parameters and how are the corrections made? The current CASA model seems to prefer external tables to store calibration corrections, which are applied to the DATA column of the MS to generate a CORRECTED_DATA column. The external tables are comparable to an AIPS SN table.

Another issue is the acceptance of external code into the CASA development repository. This needs to be discussed with the main CASA developers at NRAO.

In the more distant future we need to develop a test dataset that we can use for testing and verification of the new software, and for comparison with existing packages. A standard cm-VLBI dataset should be available for this purpose. In the long run, a simulated dataset could also become available.

Actions:
- Ilse: get in touch with Jeff Kern on the requirements for CASA development and acceptance
- Ilse: invite Ian over for a visit
- Ilse: get the following stuff to Des:
  - Neal Jackson's script
  - HOPS fourfit documentation and links
- Ilse: put the BHC management documents and software analysis on the JIVE wiki
- Ilse: irculate the FITS-MS conversion poster from Dirk Petry
- All: think about a suitable verification dataset
- Des and Mark: talk to Dirk Petrie when they go to Garching next week
- Des: take a look at the bandpass module in Casa
- Des at some point could look at Hops 4-fit, talk to Neal Jackson, Ger van Diepen
- Mark to look into FITS-IDE -- MS conversion

We will reconvene in ~4 weeks to discuss progress.