

Internal JIVE BlackHoleCam meeting

Date: 19 Oktober 2015, 11:30 in Arpad's office

Subject: pipeline WP, simulations WP

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

This meeting is intended to get an update on the CASA pipeline development for EHT and discuss ongoing efforts in the simulation work.

General news

There was a very positive e-mail from the NRAO CASA team with feedback on the report that we send to them. They are eager to start collaborating on improving and adjusting CASA for VLBI processing. Mark will reply with his suggestions on how to move ahead.

Furthermore: Bill Cotton will be visiting the Netherlands, probably somewhere in November. Ilse and Mark are in touch with him and Huib Intema in Leiden, to coordinate a joint visit to talk to Bill, either here or in Leiden. Bill has a very specific view on fringe fitting in CASA.

Fringe fitting development

Des is working on the comparison of the minimization algorithms and has a strong preference for a specific one. All algorithms have problems with the absolute range of the axes: one axis has a very large range, the other is extremely small. The numbers need to be scaled to \sim unity for the solver to work well. AIPS must handle this too, it is not clear how.

As a sanity check, Des will compare the original global fringe results to the optimized global fringe results. The differences should be small.

Mark comments that HOPS functionality requires the setting of a search window per baseline. That is possible. For the global fringe search it is not. This will be implemented after the AIPS functionality is finished. Des already has a HOPS-like interface to verify the fringe per baseline.

AIPS has the possibility to include a sky model c.q. source model. This will be necessary for wide fields, but not for VLBI. This can be retrofitted into the code.

The next step is to compare the AIPS output with the results from Des' code. This will be a combined action on Ilse and Des.

Data processing in CASA

Mark reports that the CASA imaging works. Due to a bug in the importing script, one polarization was completely flagged. The CASA clean task doesn't work then. It would be useful to compare the CASA image to output from other imagers, but this requires some more thought. Ilse suggests this may have been done for LOFAR imaging, and will inquire. For a first sanity check we can compare peak

fluxes and RMS noise in the image between CASA and AIPS imagers. Mark suggests to compare the visibilities after calibration.

Mark also worked on self-calibration, but this fails when the source has structure.

There is still an issue with CASA taking a very long time when it needs to generate a new MS table. Once the table exists, it is much faster. This could be included in the communication with the CASA developers at NRAO.

Simulations work

The team in South Africa has given up on waiting for the MeqTree tropospheric module. They are developing their own Python script to simulate VLBA 43GHz observations, and will move to higher frequencies and incoherent array simulations from there. First they need to fine tune the physics of the troposphere. Once they have a first set of reliable simulations, we will get access to them for testing the new software.

It seems that Pim has found a new job, and we do not expect him to deliver the MeqTree module. Ilse contacted Heino with concerns about the delivery of this module, but didn't hear back yet. She will contact Heino again.

Actions:

ID	Description	Owner	Ref.	Due
1	Compare minimization tasks	Des	150914	done
2	Inform Remo about views on meta data standardization	Ilse	150914	done
3	Inform Remo about data format and request FITS-IDI output for 2015 run	Ilse	150914	done
4	Write note on motivation for solver	Des	151019	
5	Compare prototype results to AIPS output	Des & Ilse	151019	
6	Write report on comparison with AIPS	Des & Ilse	151019	
7	Contact NRAO CASA dev with suggestions for improvement of CASA VLBI data processing	Mark	151019	
8	Coordinate visit of Bill Cotton	Mark & Ilse	151019	
9	Inquire about imager studies for LOFAR	Ilse	151019	
10	Contact Heino about status of MeqTree development	Ilse	151019	

Next meeting: November 16th, 11:00