External JIVE BlackHoleCam meeting

Date: 17 May 2016, whole day
Visitor: Daan van Rossum, Radboud Radio Lab, Nijmegen
Present: Daan van Rossum, Des Small, Mark Kettenis, Ilse van Bemmel

Daan has recently joined the team in Nijmegen as software developer. Part of his job will be the development and verification of a CASA mm-VLBI pipeline dedicated to EHT data processing. He is visiting to learn about VLBI in general, data processing and the software development taking place in JIVE. We have a brief discussion on interferometry basics, then continue to discuss our current development for the data reduction process in CASA and how to shape the collaboration between JIVE and Nijmegen.

The pipeline development in JIVE has focused on providing the CASA tools needed to process VLBI data in CASA. It will deliver a calibrated MS, and accept as input a FITS-IDI or MS which includes all required meta-data. The interface and meta-data discussion has not been solved with the EHT, and requires much more discussion, but is not within the JIVE scope of the project.

Plans for Daan:

1. Get insight into data processing in AIPS and CASA (regular interferometry data processing)
2. Go over the VLBI data processing tutorial to learn about VLBI specific steps
3. Look at existing EVN pipeline
4. Develop environment for beta testing in Nijmegen: build a local CASA development version
5. Set up repository for code sharing

Ad 1.
CASA is available from the NRAO website as a binary distribution, which is easy to install. A good tutorial is from the NRAO summer school in 2014:
https://casaguides.nrao.edu/index.php/VLA_Continuum_Tutorial_3C391-CASA4.6

AIPS 31DE15 is also available from the NRAO websites as a binary distribution. The AIPS Cookbook has an extensive description of data processing.

Datasets are available from the NRAO archive. Note that for AIPS you need FITS format, while for CASA you need the MS format. CASA can convert MS to FITS. For the CASA tutorial you can use the dataset provided there. For AIPS a good experiment seems to be AS561 with target 3C196, which should be a bright source and relatively easy to process, or simply convert the CASA dataset to FITS for a one-on-one comparison of the steps.

Ad 2.
Use N14C3 experiment, target 3C345. You can get the files from the EVN archive by selecting this experiment and then go to Fitsfiles. From there follow the EVN online user guide.

Ad 3.
A zip file with the EVN pipeline is provided separately. You will need to install ParselTongue and AIPS to run it. Especially ParselTongue can be challenging. However, even without running the scripts, it should give you an idea of what steps are needed for cm-VLBI.

Ad 4 & 5.
Daan will set up local CASA development environment on dedicated machine in Nijmegen, this requires a machine with sufficient memory and processing capabilities.
As part of the visit we have set up a repository to which JIVE developers can push. This is already in place now, Des has shared his code here, Mark needs to do some cleaning up before he can put things in.