

RPICARD: A CASA-based Calibration Pipeline for VLBI Data

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Currently, HOPS and AIPS are the primary choices for the time-consuming process of (millimeter) very long baseline interferometry (VLBI) data calibration. However, for a full end-to-end pipeline, they either lack the ability to perform

easily scriptable incremental calibration or do not provide full control over the workflow with the ability to manipulate and edit calibration solutions directly. CASA offers all these abilities, together with a secure development future and an intuitive python interface, which is very attractive for young radio astronomers. Inspired by the recent addition of a global fringe-fitter, the capability to convert fits-idi files to measurement sets, and amplitude calibration routines based on antab metadata, we have developed a fully automated CASA-based VLBI data reduction pipeline.

The pipeline will be able to handle data from multiple arrays: EHT, GMVA, VLBA and the EVN in the first release. Polarization and phase-referencing calibration are supported and a spectral line mode will be added in the future. The large bandwidths of future radio observatories ask for a scalable reduction software. Within CASA, a message passing interface is used for speedup. The most significant gain is obtained for the time-consuming fringe-fitting task as each scan can be processed in parallel.