

Gravitational lenses

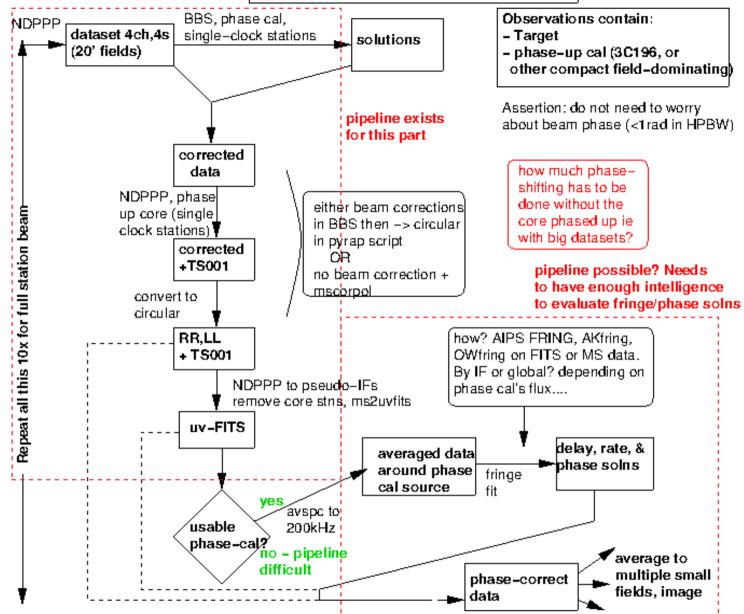
- 3 lenses awarded for cycle 0, 1 for cycle1
- Data taken
- Analysis status: first one analysed (0957+561), 30 subband image produced
- Trying to install LofIm in Manchester

- Long baseline data analysis- general status
- Analysis process for 0957+561
- General remarks and intended progress

LONG BASELINE PIPELINE STRUCTURE v1 BBS, phase cal. Observations contain: NDPPP dataset 4ch,4s single-clock stations - Target solutions (20' fields) phase-up cal (3C196, or other compact field-dominating) Assertion: do not need to worry pipeline exists about beam phase (<1 rad in HPBW) for this part corrected how much phasedata shifting has to be NDPPP, phase done without the either beam corrections up core (single core phased up le in BBS then -> circular clock stations) with big datasets? in pyrap script corrected OR +TS001 pipeline possible? Needs no beam correction + 45-3000 L COM to have enough intelligence mscorpol convert to Repeat all this 10x for full to evaluate fringe/phase solns circular **RR.LL** how? AIPS FRING, AKfring, NDAPP + TS001 OWfring on FITS or MS data. (single clock) By IF or global? depending on NDPPP to pseudo-IFs phase cal's flux.... remove core stris, ms2uvfits uv-FITS delay, rate, & F3001 averaged data bhase solns around phase fringe cal source. avspc to usable 200kHz phase-cal? no - pipeline average to difficult multiple small phase-correct fields, image data Algorithms/scripts by OW,TC,ADe; pipeline

Algorithms/scripts by OW,TC,ADe; pipeline implemented with two metascripts (locapi.py and lofipi.py, available on LBWG wiki; NJ/ADr)

LONG BASELINE PIPELINE STRUCTURE v1

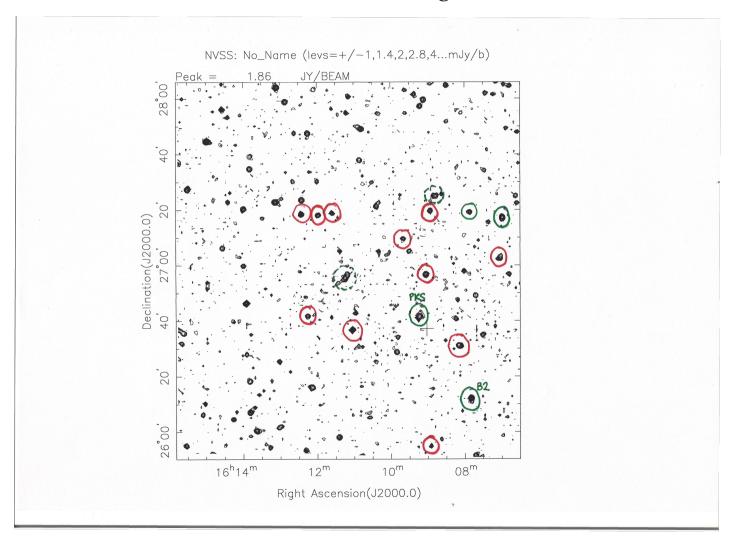


- 1) It works
- 2) User discretion still advised
- check superterp phase calibration
- for all but very simple sources, need to interact with the phase cal/ imaging at end
- phase transfer is not straightforward
- consult LB wiki for updates

Algorithms by OW,TC,ADe; pipeline implemented with two metascripts (locapi.py and lofipi.py, available on LBWG wiki; NJ/ADr)

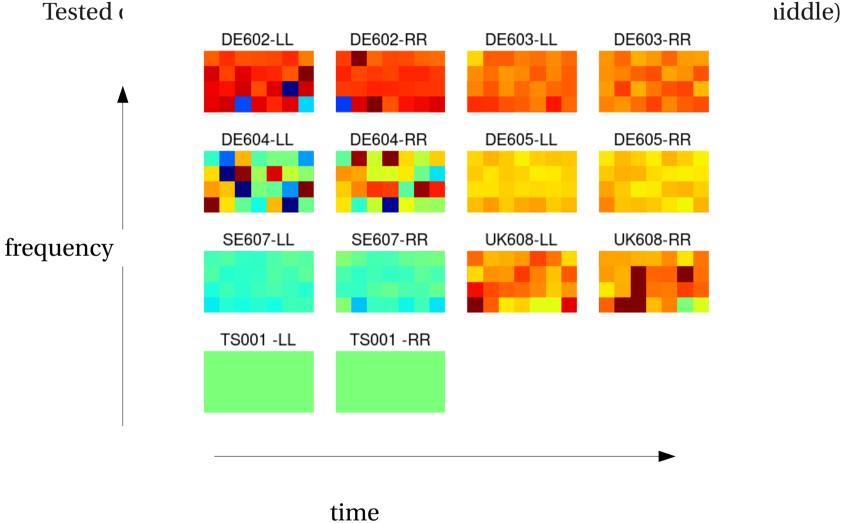
General remarks on the functioning of the pipeline

Tested on MSSS data of H242+27 field (has bright calibrator in the middle)



Bottom line: reasonable number of sources per field found, but transferring phase from one to another is hard (could not transfer PKS -> B2 source and map it)

General remarks on the functioning of the pipeline Tested (



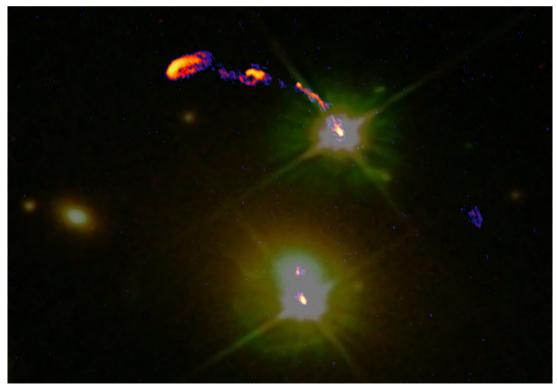
Fringe solutions give a good idea of which stations are working and which aren't; fair amount of trouble with DE604

Analysis of the 0957+561 data

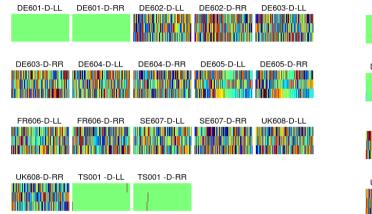
- 30 subbands used
- Core stations phased into TS001 superterp station using locapi.py script
- Conversion to circular using MSCORPOL
- Formed into 3 Ifs of 10 channels each and read into AIPS
- Fringe fitted and calibrated/imaged by hand, either
 - * without using a model
 - * using a model from e-MERLIN:

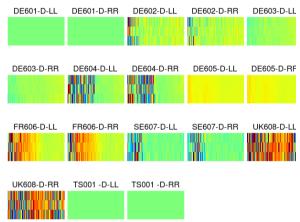
Analysis of the 0957+561 data

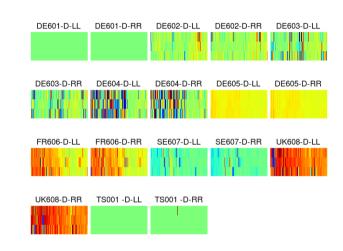
- 30 subbands used
- Core stations phased into TS001 superterp station using locapi.py script
- Conversion to circular using MSCORPOL
- Formed into 3 Ifs of 10 channels each and read into AIPS
- Fringe fitted and calibrated/imaged by hand, either
 - * without using a model
 - * using a model from e-MERLIN:



Collapse data around three points: Q0957+561, nearby calibrator (0954+556) and a piece of blank sky:



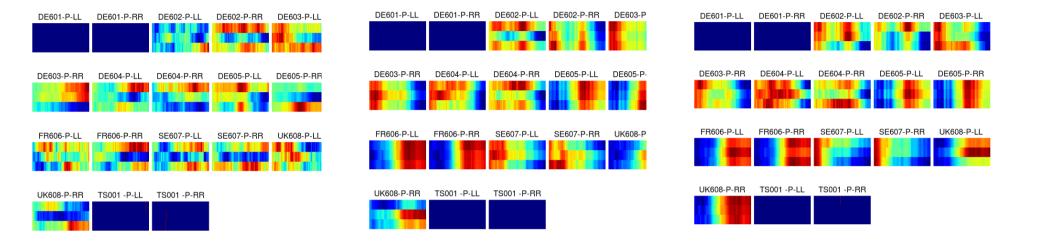




Left to right: blank sky, phase calibrator, target

Comments; 1) obviously working!; 2) UK608 very intermittent;

3) coherence seems to come and go on longest baselines (may need to edit a little)



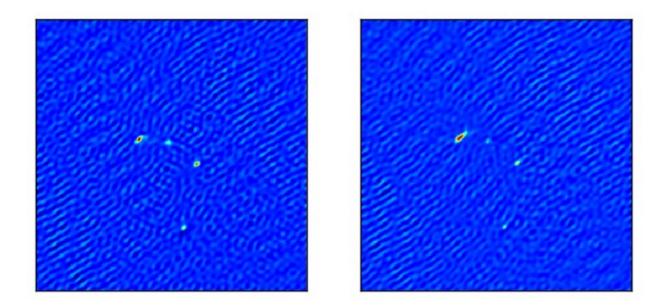
Phase plots harder to interpret (phase wrapping) but seem to confirm impression from delay solutions

Calibration needs a lot of care – similar to e-MERLIN commissioning phase

- crucial not to overfit starting model (you can do anything you like if you leave the data weights alone and give it a model – if you put in a point, Q0957 comes out as a point)
- have to play carefully with the data weights in the first pass
- currently multiply TS001 by some appropriate factor first
- L1 solution is very important (CASA/BBS do not [?] do this yet)
- crucial to be very careful about windowing on initial passes
- crucial to get the phases right first, then switch on amplitude selfcal

The good news: maps made successfully by

- e-MERLIN starting model (but need to be very careful, see above)
- transferring initial phase from 0954+556 to Q0957+561 (about 0.7 degrees) and improving map thereafter with selfcal



Left: e-MERLIN starting model. Right: transferring phases from 0954+556.

Comments:

- 1) Will get better: only 1/8 data so far, and needs editing/tweaking of calibration
- 2) Second method to be preferred if possible
- 3) Shows that successful transfer of calibration is possible; more work needed to see whether this is universally possible
- 4) Needs care in the post-pipeline calibration/imaging likely a permanent feature