
ASTRON
Netherlands Institute for Radio Astronomy

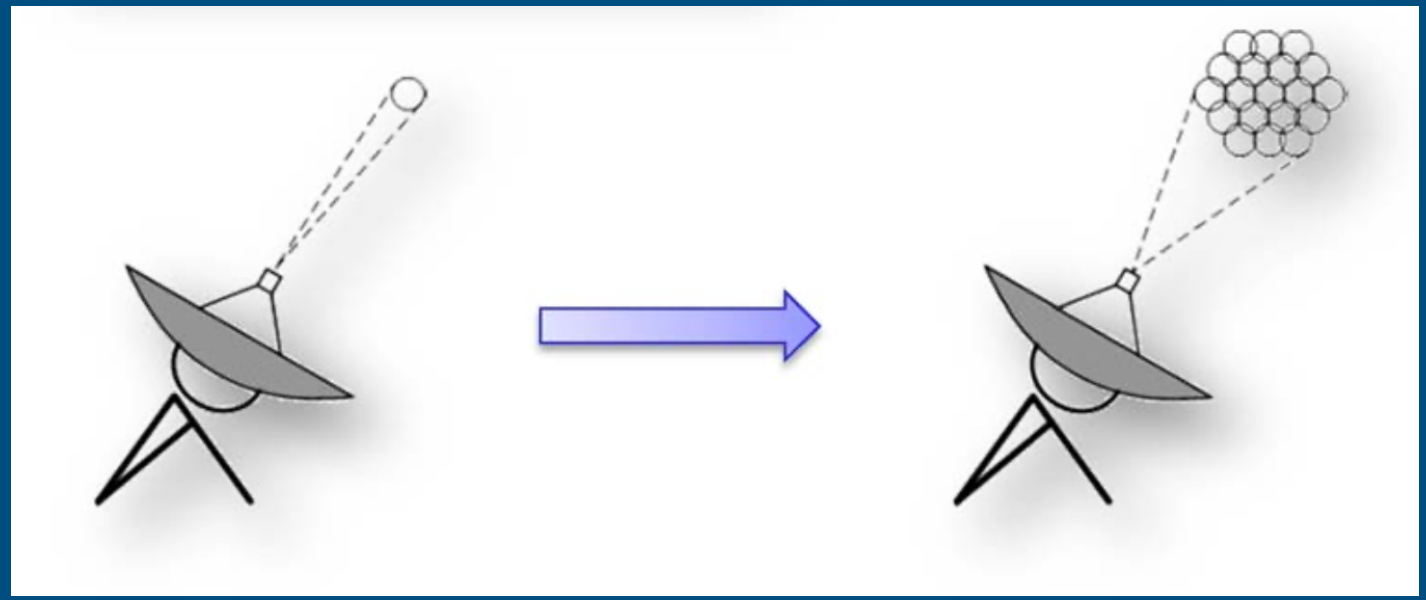
Apertif DR1

Yan Grange, **Mattia Mancini**, Hanno Holties
and the Apertif team

ASTRON
Netherlands Institute for Radio Astronomy

Apertif, Phased Array Feeds for the WSRT

- Transform the WSRT into an efficient 21-cm survey facility
  - 17x Survey speed increase
  - SKA Pathfinder

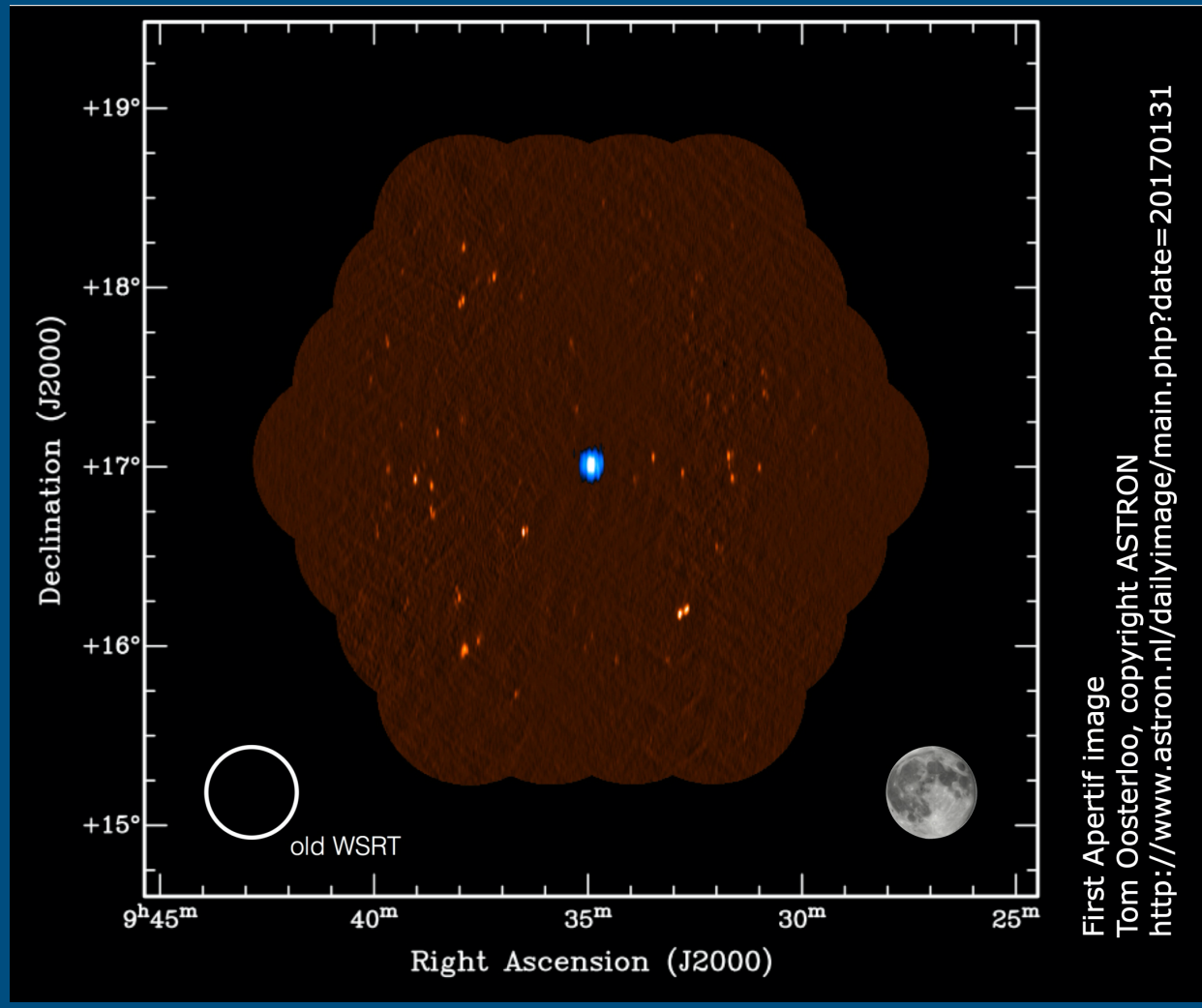


APERTIF
APERture Tile In Focus

ASTRON
Netherlands Institute for Radio Astronomy

Apertif

- Original 4 year legacy survey program
  - ~350 sq degree medium deep survey (10x12 hr)
  - ~3500 sq deg wide survey (1x12 hr)
- Radio continuum, polarization and neutral hydrogen
- Role of environment & interaction on galaxy processing
- Finding the smallest galaxies
- Connecting cold gas to AGN
- Understanding the faint radio population
- Studying magnetic fields in galaxies

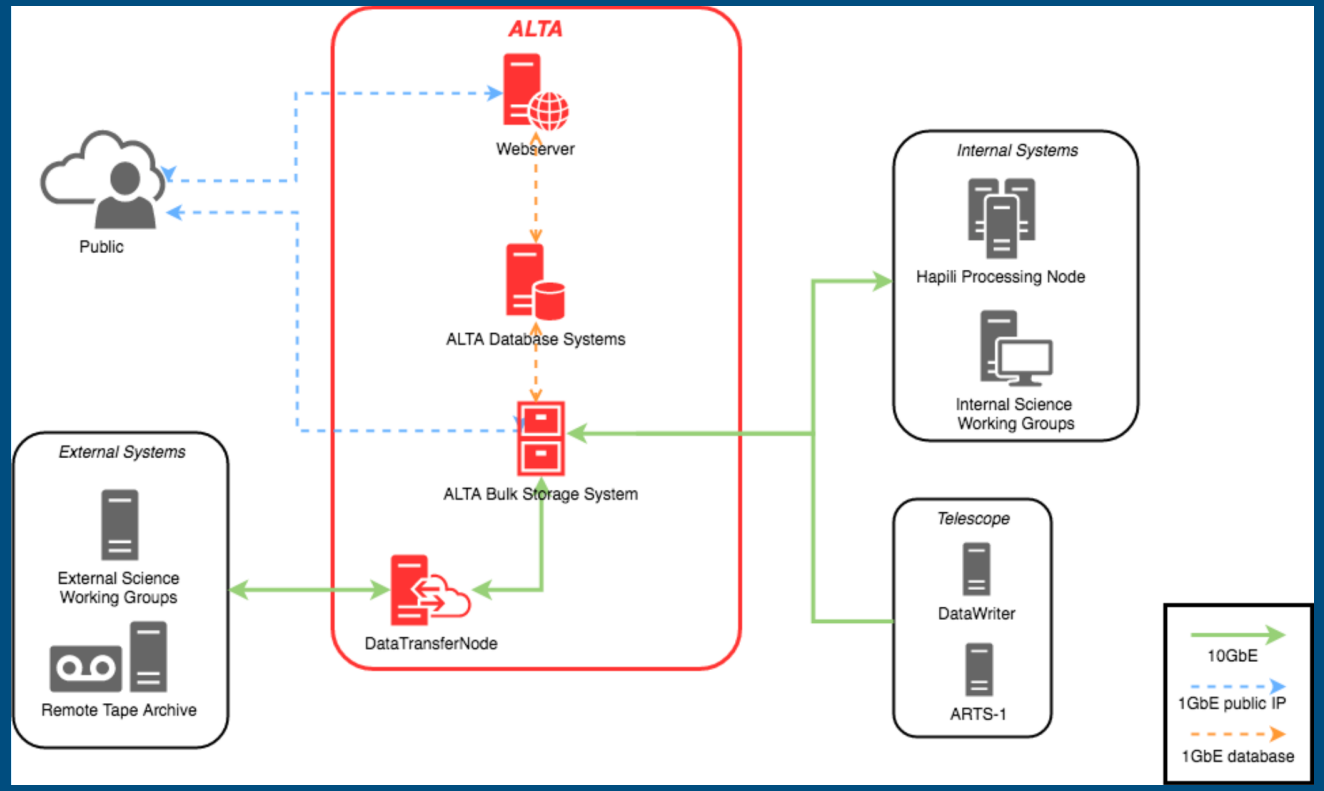


APERTIF
APERture Tile In Focus

ASTRON
Netherlands Institute for Radio Astronomy

ALTA – the Apertif Long-Term rchive

- ALTA is the main source of Apertif data.
  - VO interface is the main interface for external user access



- ASTRON (Dwingeloo): Online storage (including 'nearline' object store)
- SURFsara (Amsterdam): Offline storage (including online cache & staging)
- Using IRODS for internal data management

https://alta.astron.nl

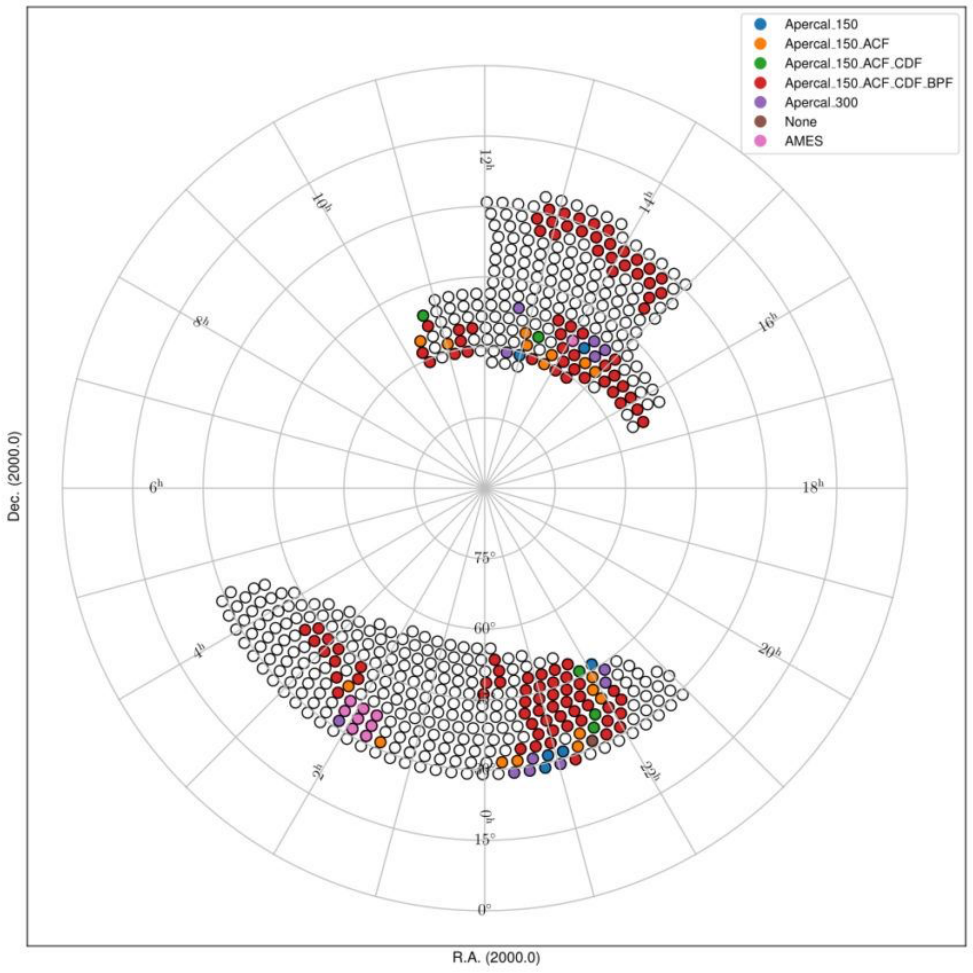
APERTIF APERture Tile In Focus

ASTRON Netherlands Institute for Radio Astronomy

The DR1 data set – the released products

Type	Discovery	Access
Raw observational data	IVOA, Apertif Long Term Archive ALTA	ASTRON Astron Help Center Radio Observatory Helpdesk → Apertif Long Term Archive ALTA
Full time, Stokes and spectral resolution calibrated visibility data	IVOA, Apertif Long Term Archive ALTA	ASTRON Astron Help Center Radio Observatory Helpdesk → Apertif Long Term Archive ALTA
Calibration tables	IVOA, Apertif Long Term Archive ALTA	ASTRON Astron Help Center Radio Observatory Helpdesk → Apertif Long Term Archive ALTA
Inspection plots	Apertif Long Term Archive ALTA	Apertif Long Term Archive ALTA
Continuum images	IVOA, Apertif Long Term Archive ALTA	IVOA ← Apertif Long Term Archive ALTA
Polarization images and cubes	IVOA, Apertif Long Term Archive ALTA	IVOA ← Apertif Long Term Archive ALTA
Line and dirty beam cubes	IVOA, Apertif Long Term Archive ALTA	IVOA ← Apertif Long Term Archive ALTA

The DR1 data set – wrt the full survey



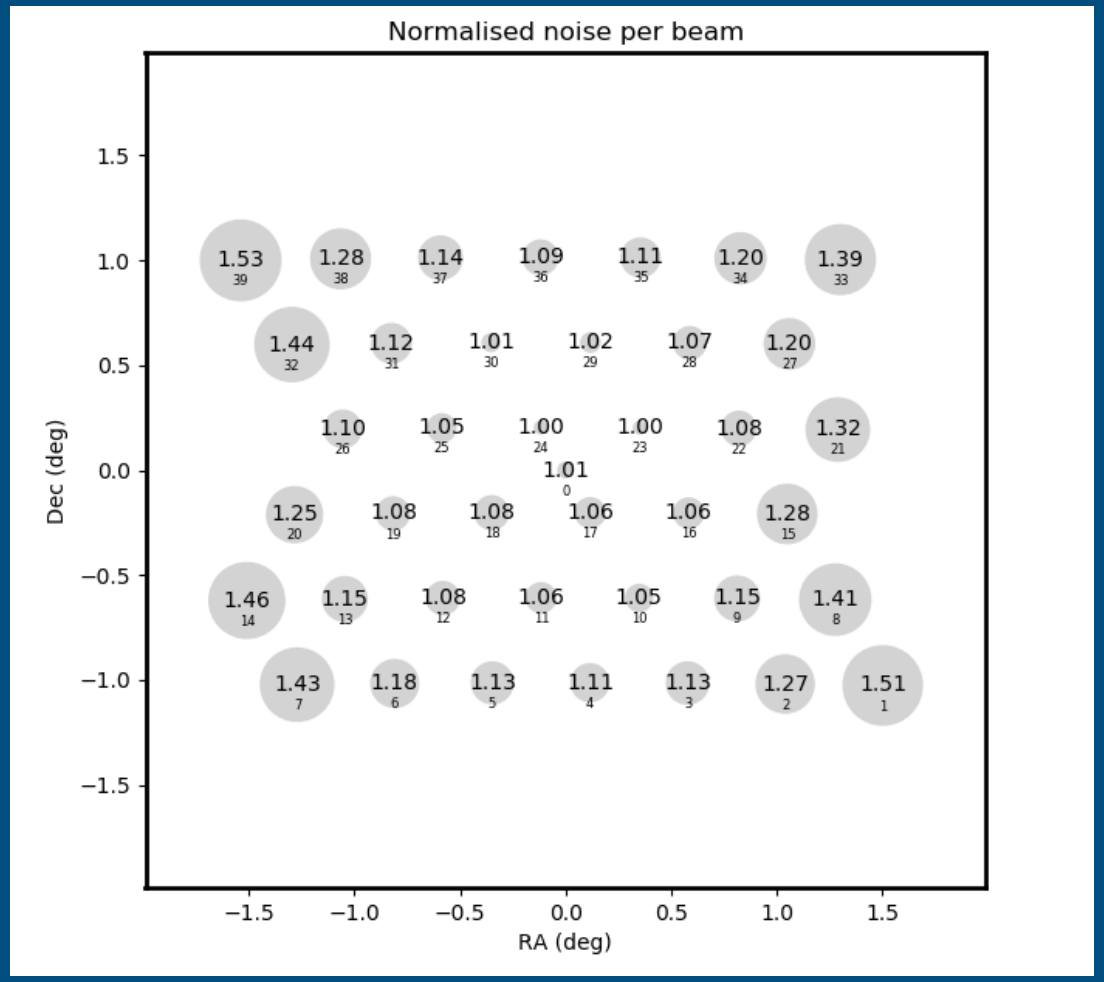
APERTIF
APERture Tile In Focus

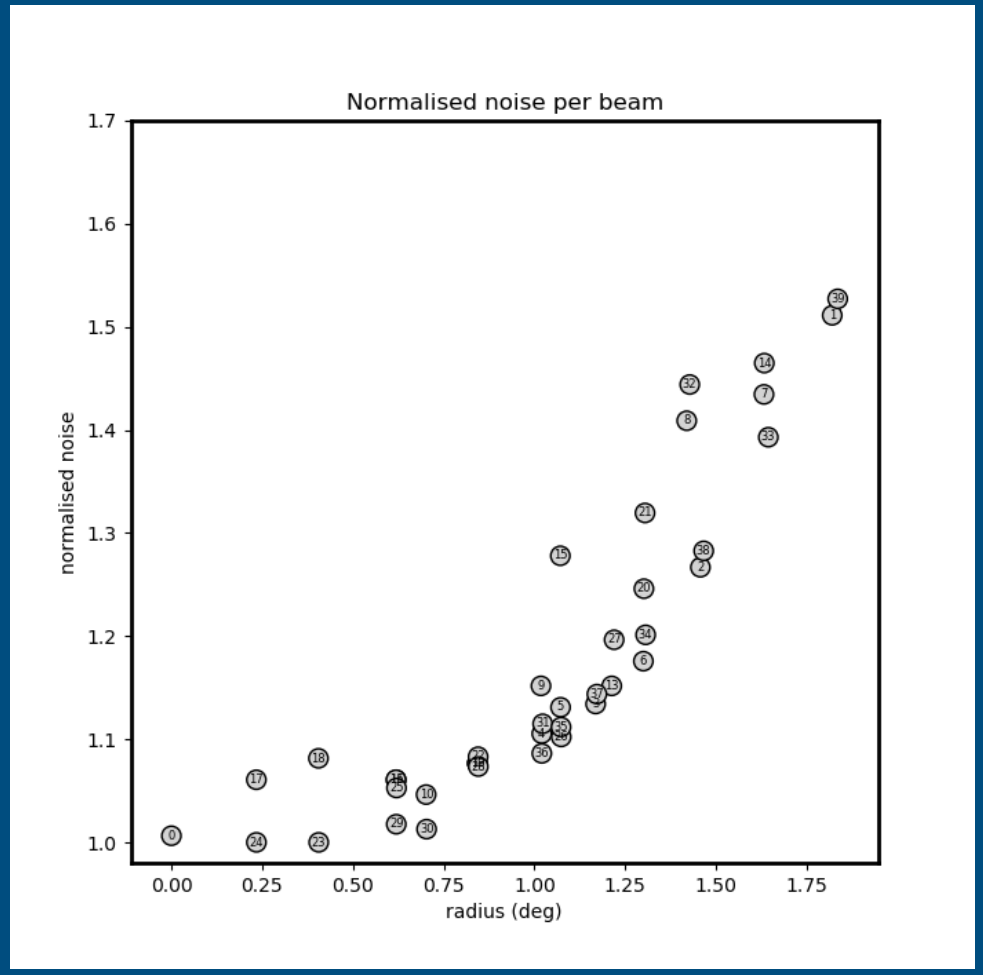
ASTRON
Netherlands Institute for Radio Astronomy

The DR1 data set – product quality

- Validation of continuum data products by assessing they meet the resolution requirements, minimum sensitivity requirements, and have no significant image artifacts.
  - Other data types released based on validation of corresponding continuum product!
- Most polarisation cubes also pass their own validation, since the criteria are comparable.
- Line cubes get flagged “G”ood, “O”kay or “B”ad depending on severity of artifacts.

The DR1 data set – beam noise





APERTIF
APERture Tile In Focus

ASTRON
Netherlands Institute for Radio Astronomy

And now… The demo!

APERTIF
APERture Tile In Focus

ASTRON
Netherlands Institute for Radio Astronomy

Closing remarks

- Currently we only have an image HiPS. Cube HiPS may be a good addition
- Looking forward to other surveys with externally-hosted data (e.g. LOTSS DR2).

- Any feedback is very welcome :)

http://hdl.handle.net/21.12136/B014022C-978B-40F6-96C6-1A3B1F4A3DB0

APERTIF
APERture Tile In Focus

ASTRON
Netherlands Institute for Radio Astronomy