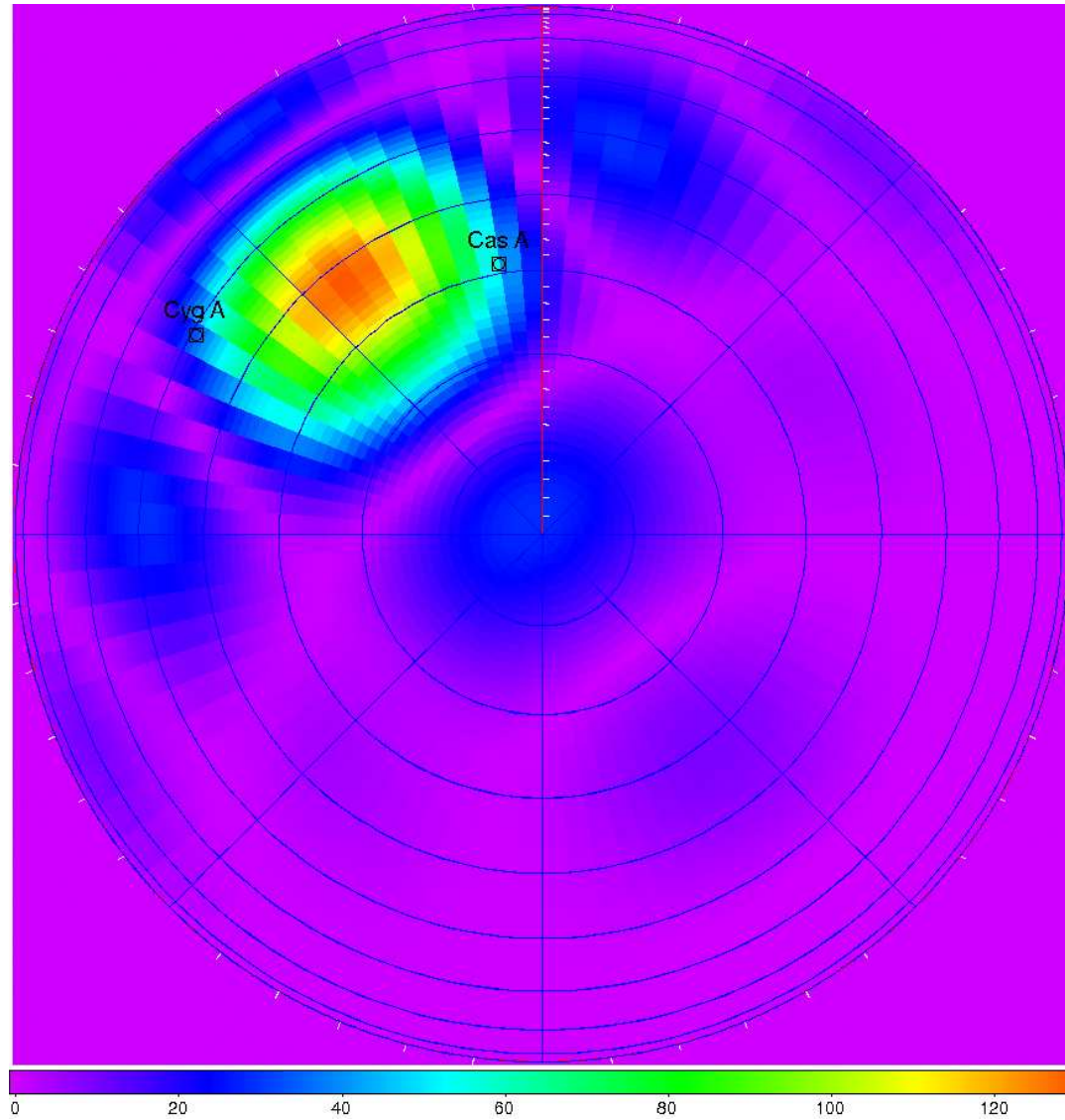


# LOFAR Calibration Update

HBA tiles - first results

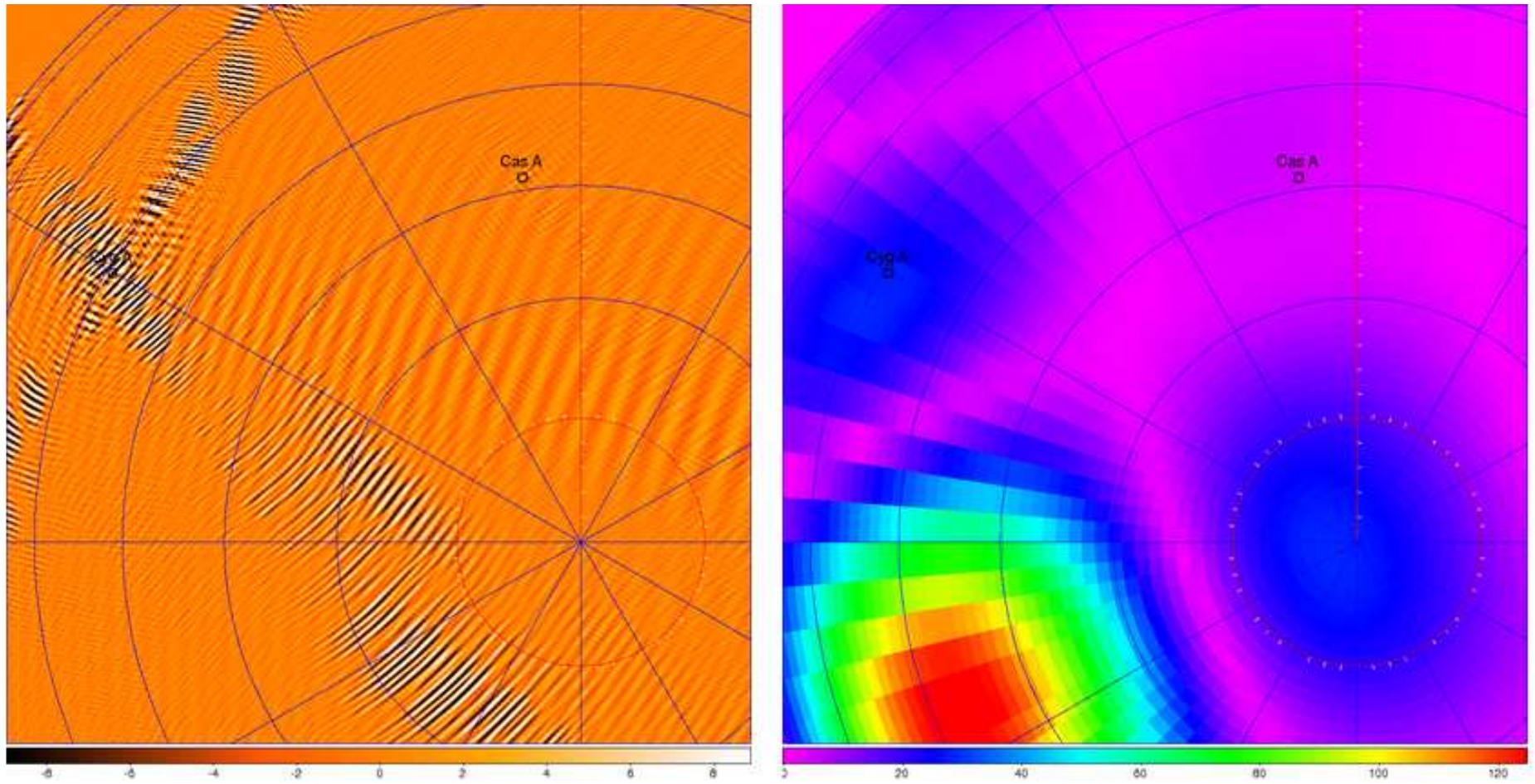
Sarod Yatawatta

# HBA tile beam



Tile beam, tracking zenith, NCP image

# Sidelobes



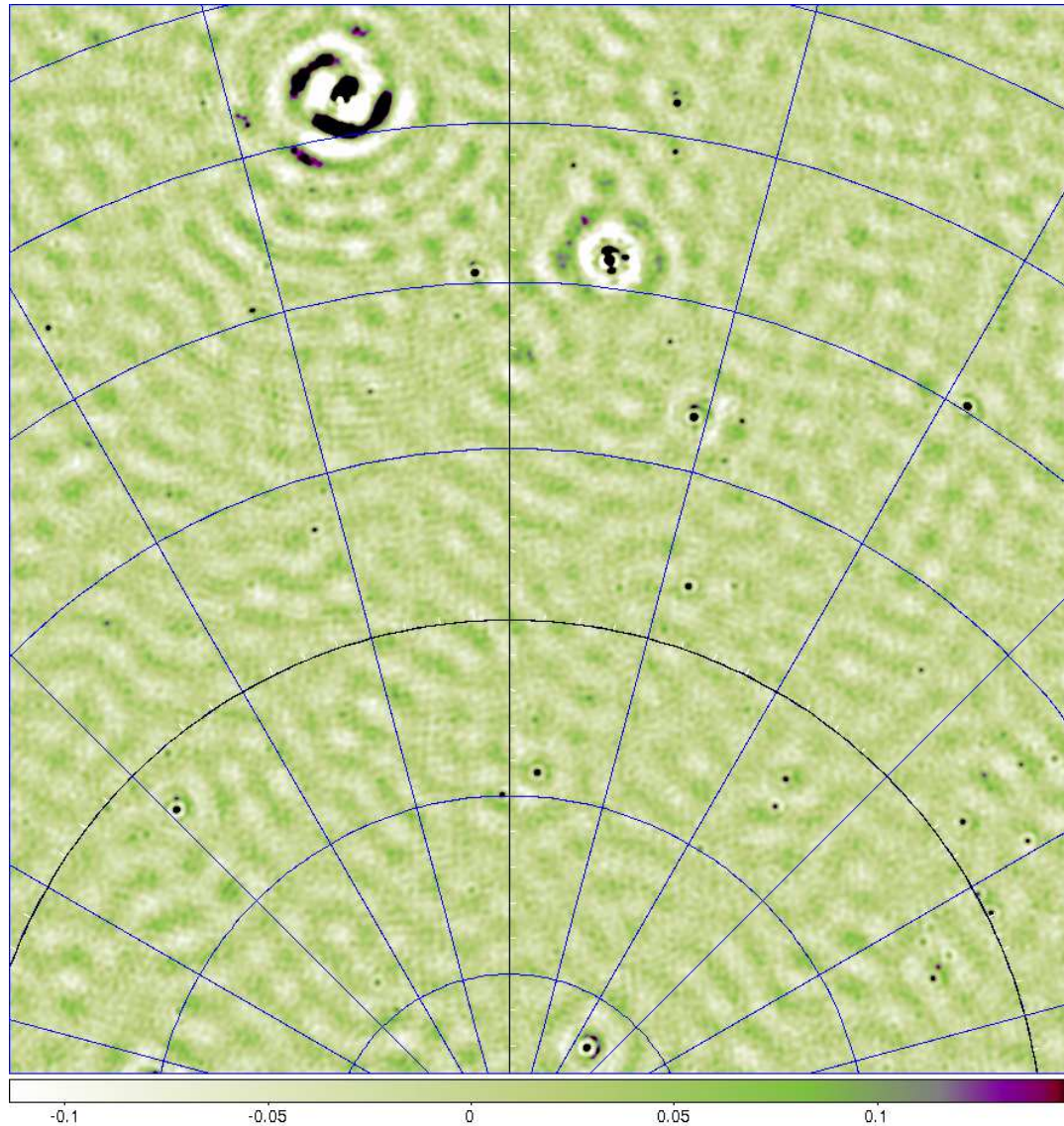
Observed image (left), Beam (right)

# Calibration

- Analytic dipole element beam (12 stations), Narrow band beam former and element beam (4 tiles).
- Clock phase, electronic gain removal ( $uv$  plane)
- Peeling off Cas A, Cyg A
- All sky 24 hr images, centered at NCP 05337
- All sky 24 hr images, centered at Cas A 05340

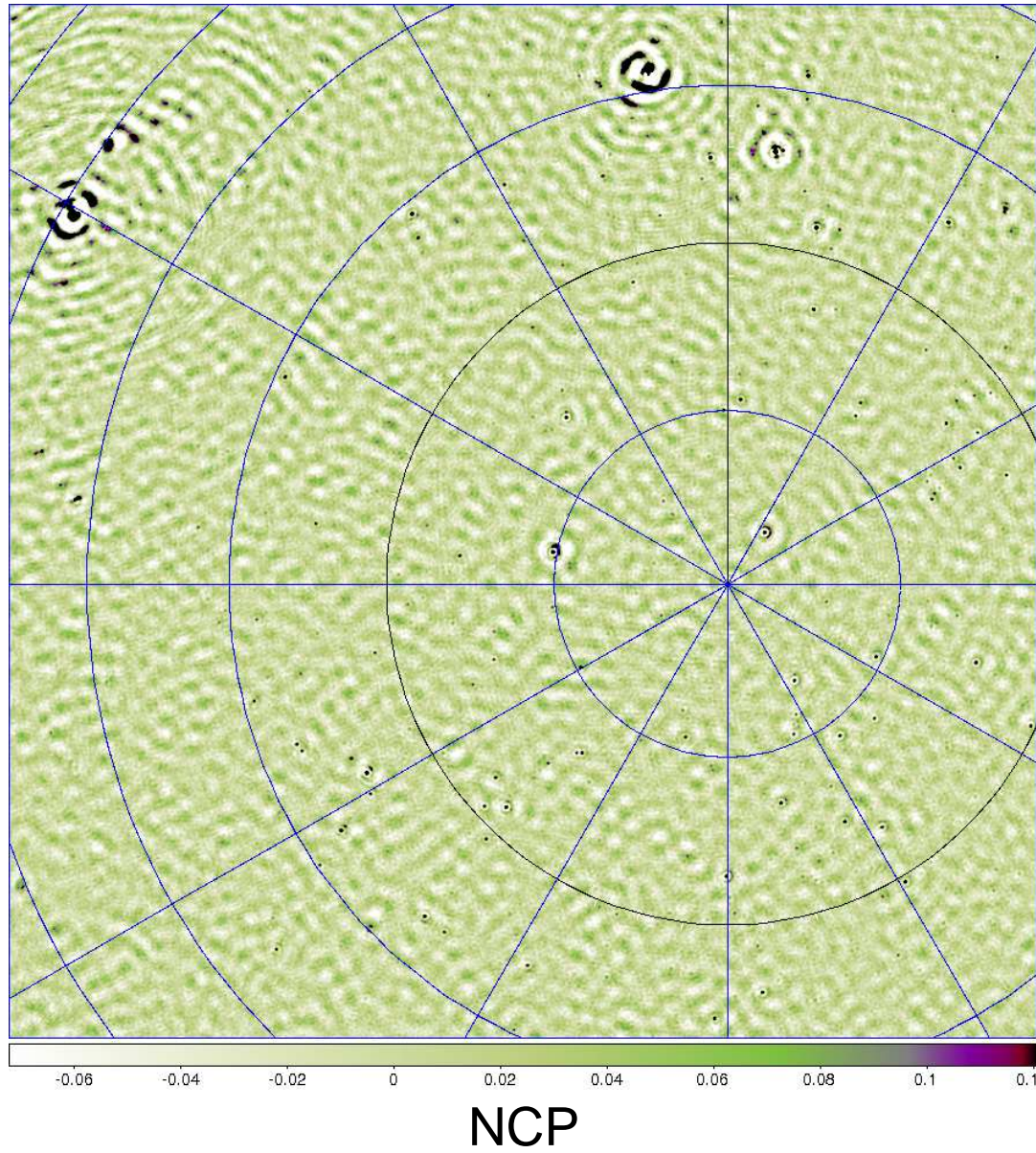


# Images



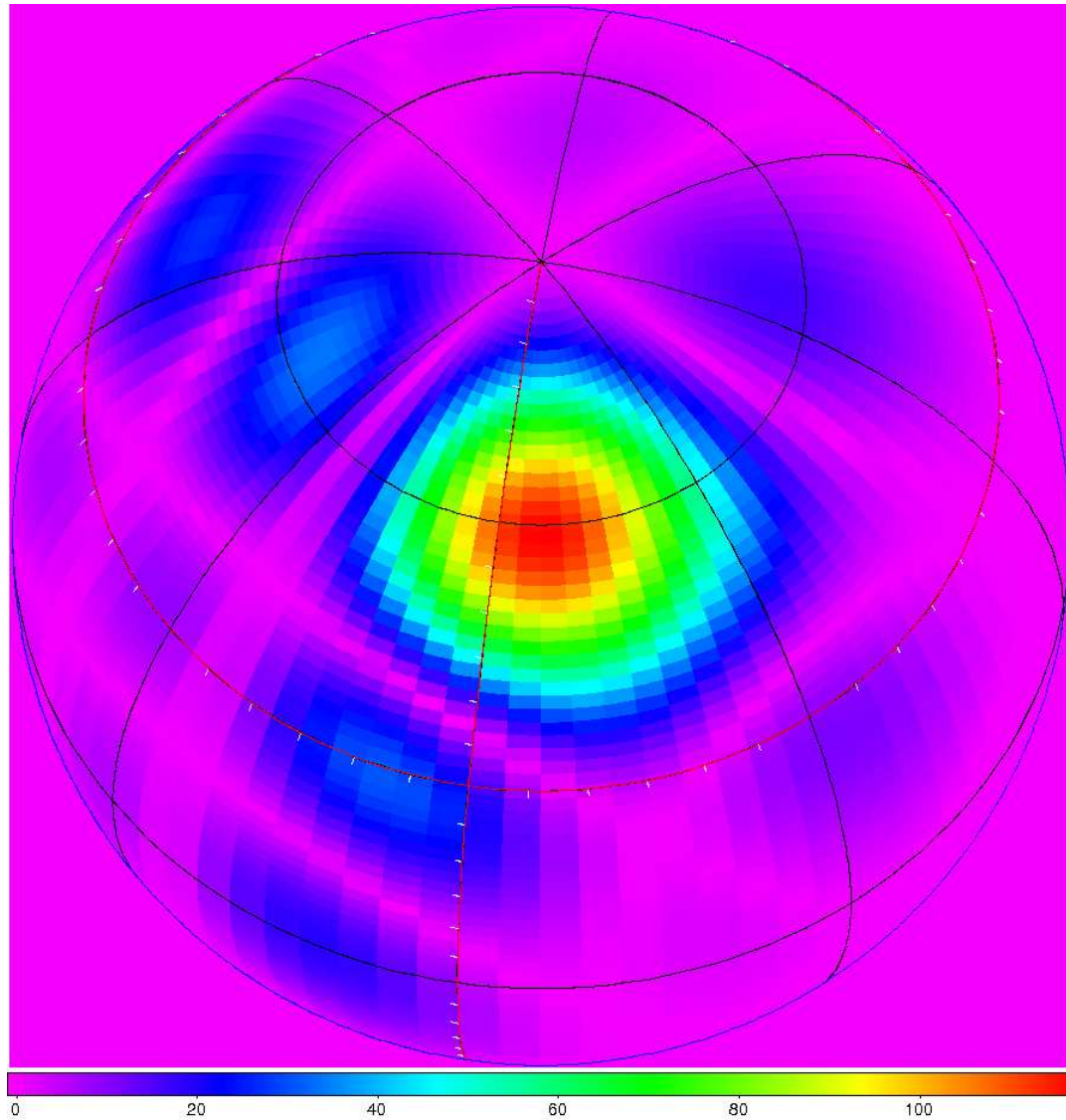
NCP: Residual around Cas A

# Images



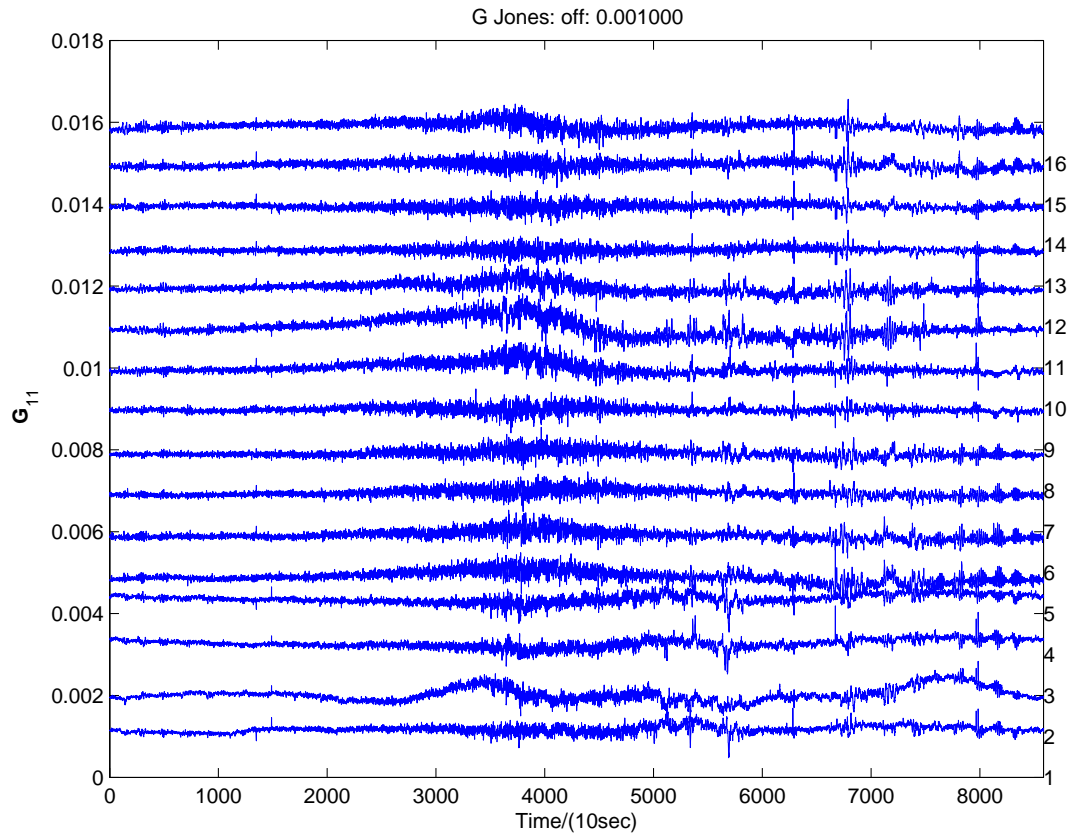


# HBA tile beam



Tile beam, tracking Cas A, Cas A image

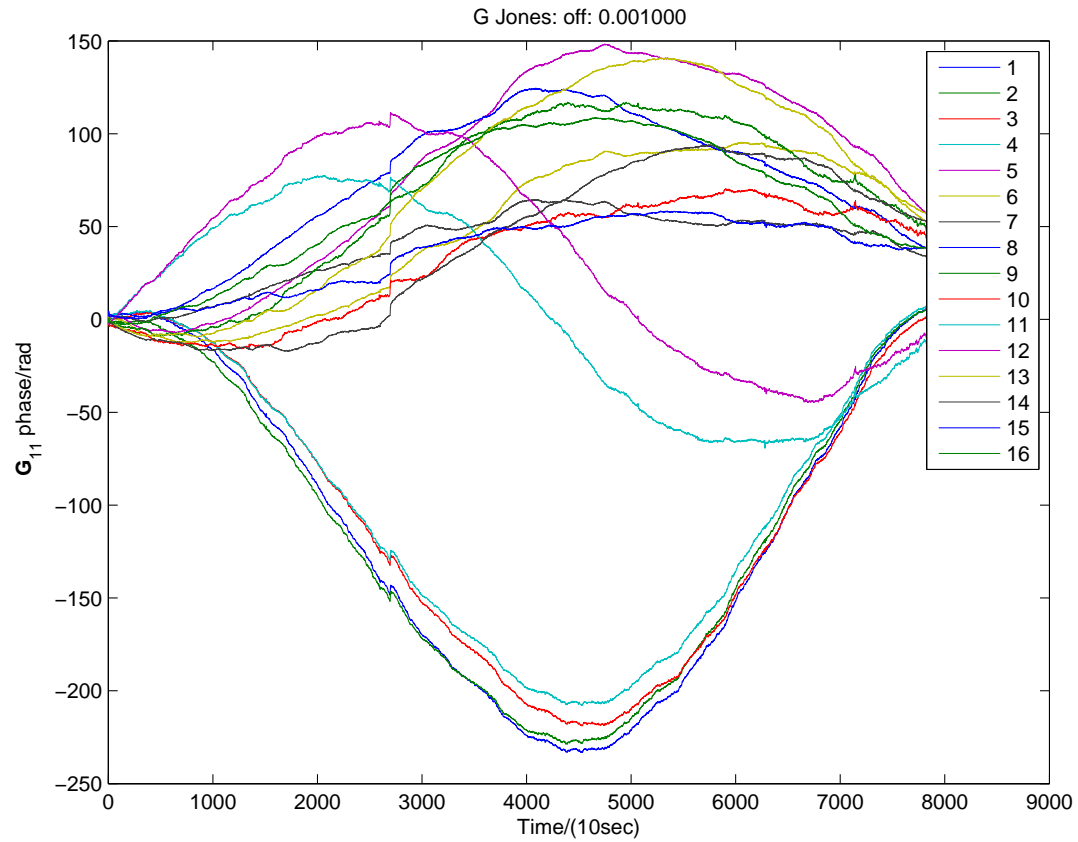
# Solutions



Tile tracking Cas A,  $G_{11}$  magnitude

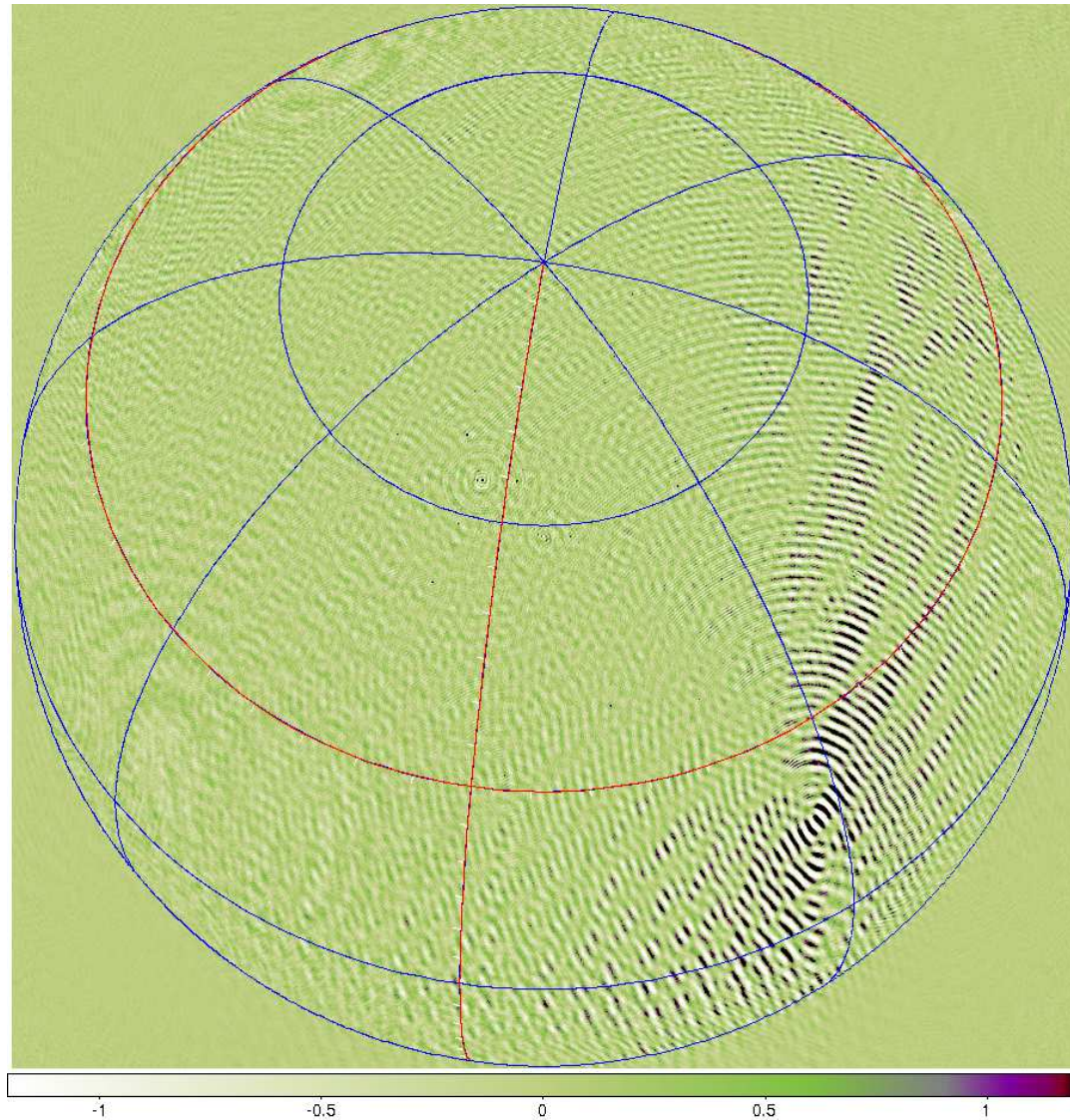


# Solutions



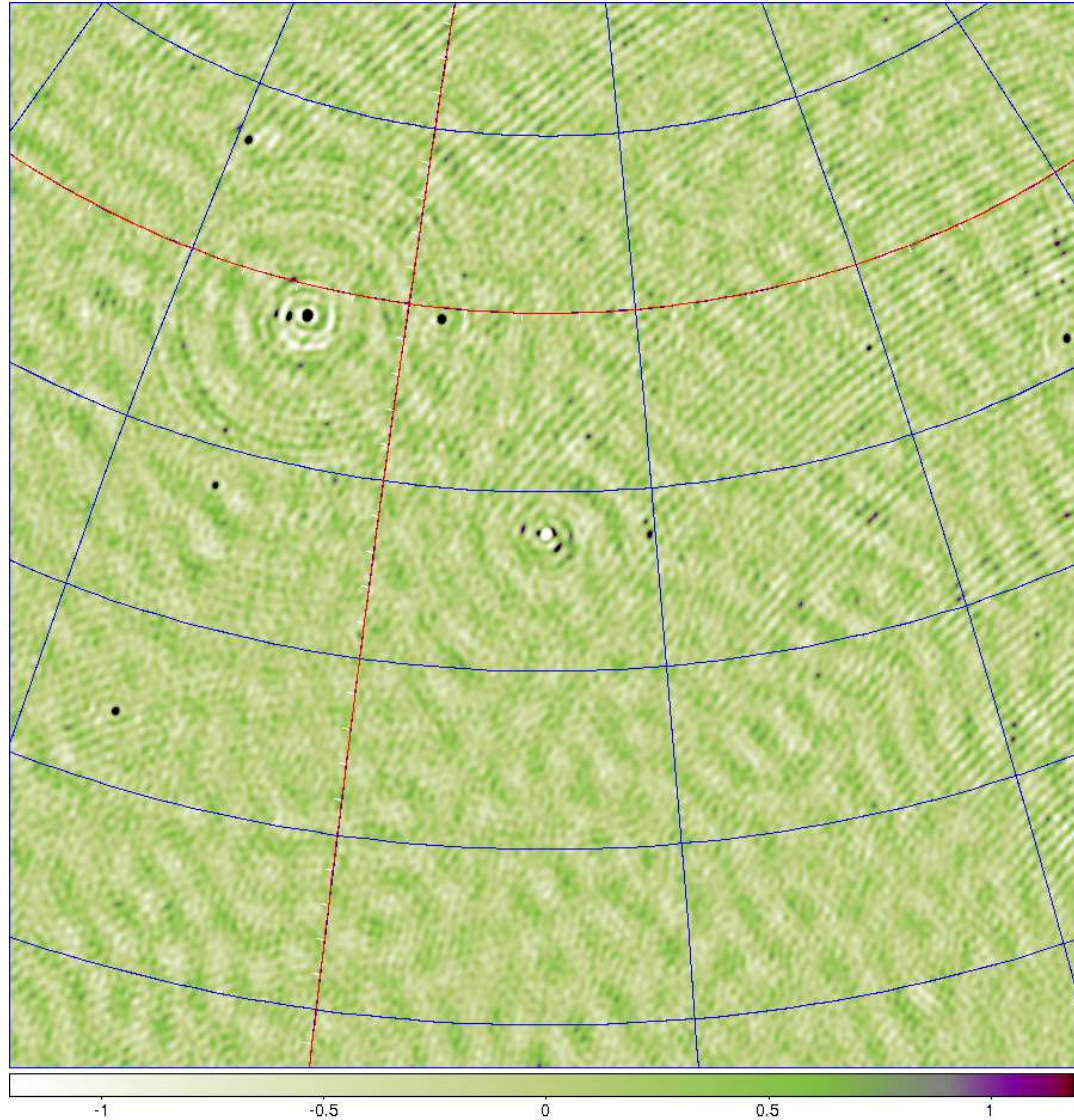
Tile tracking Cas A,  $G_{11}$  phase

# Images



Tile tracking Cas A

# Images



Tile tracking Cas A