

Deep MeerKAT L-band observations of galaxy cluster Abell 1367

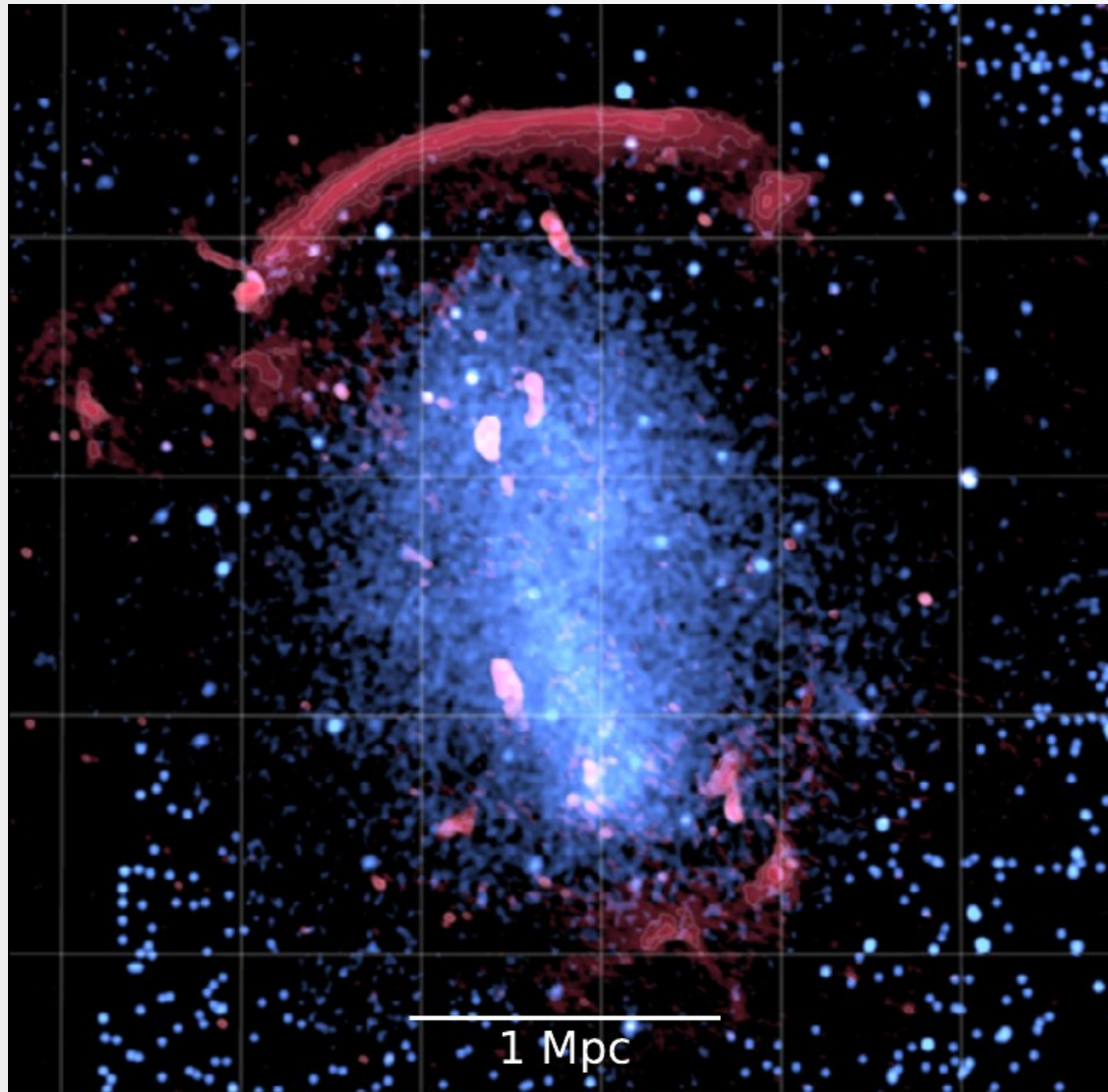
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Thüringer Landessternwarte

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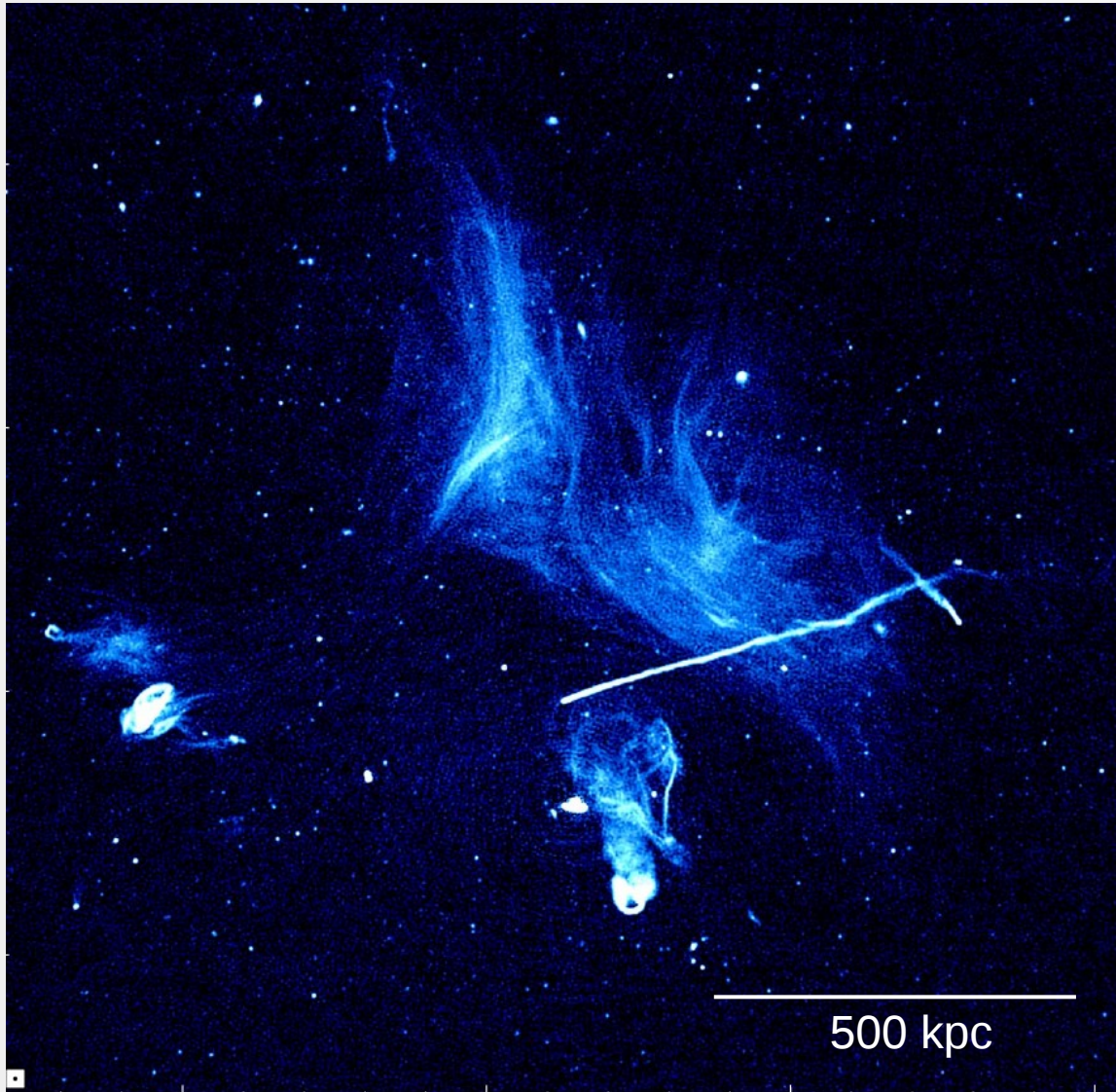


Cluster Radio relics



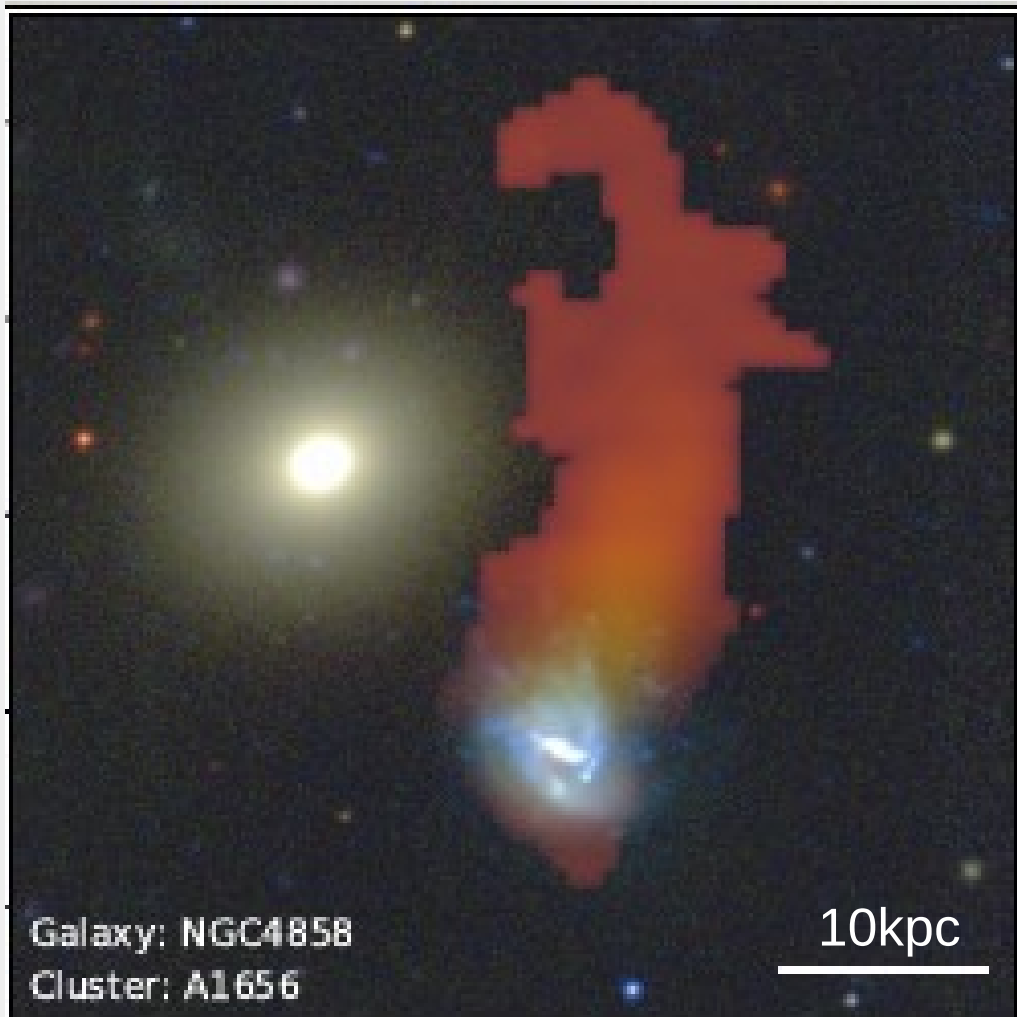
- Elongated diffuse sources tracing particle acceleration at the shock.
- Usually located in the cluster periphery.
- Shows high polarization.
-

Cluster Radio relics



- Abell 2256 relic seen face on.
- Shows large complex filamentary structures.
- LLS of the relic is around 1 Mpc.

Infalling galaxies stripped by ICM



- Galaxies are affected by the cluster environment resulting in the ram pressure stripping of gas.
- Ideal laboratories for studying ISM-ICM interaction.
- Tails are the footprints of ram-pressure stripped ISM extending several 10s of kpc.

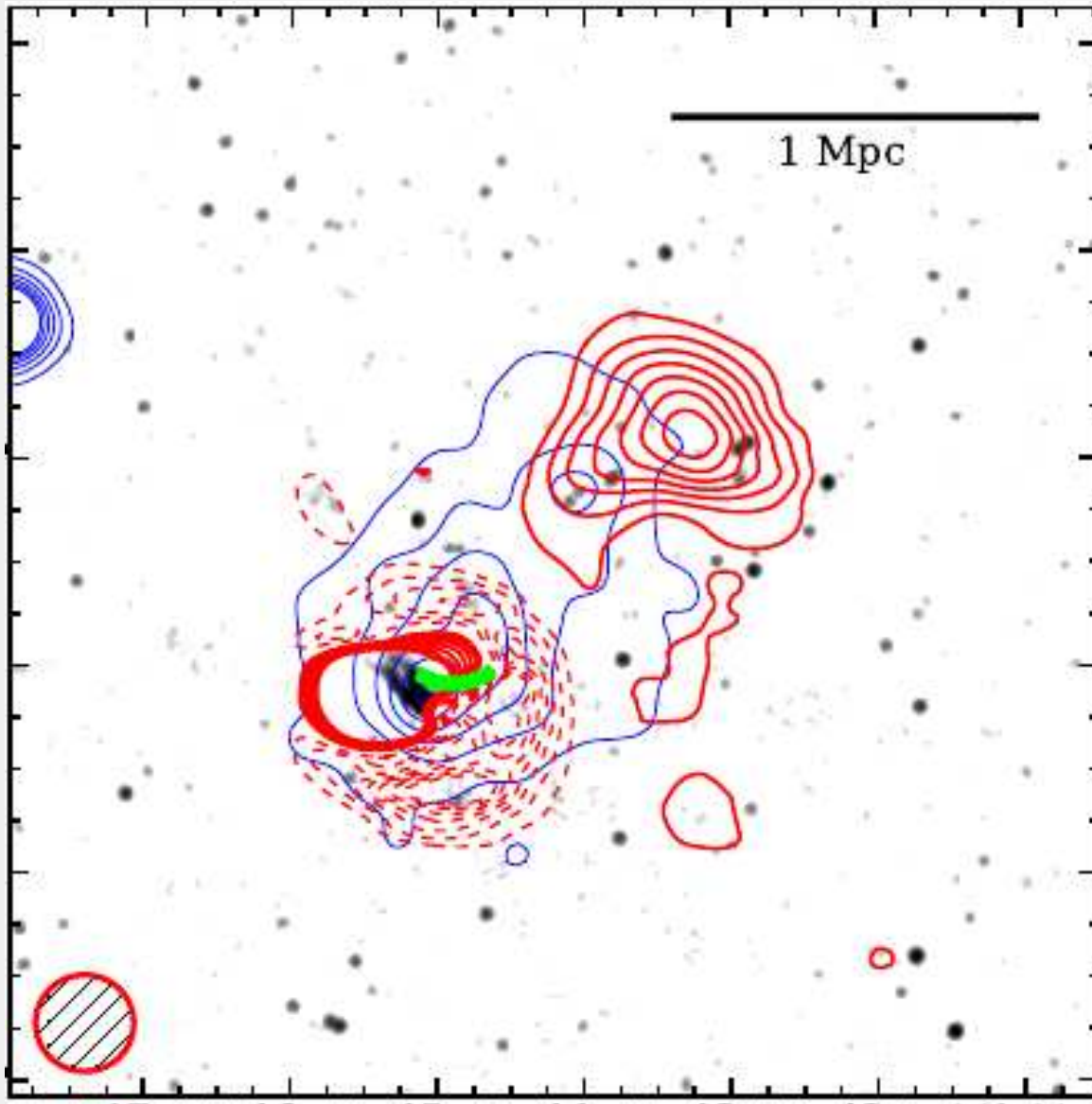
Abell 1367

Optical
X-ray

250 kpc

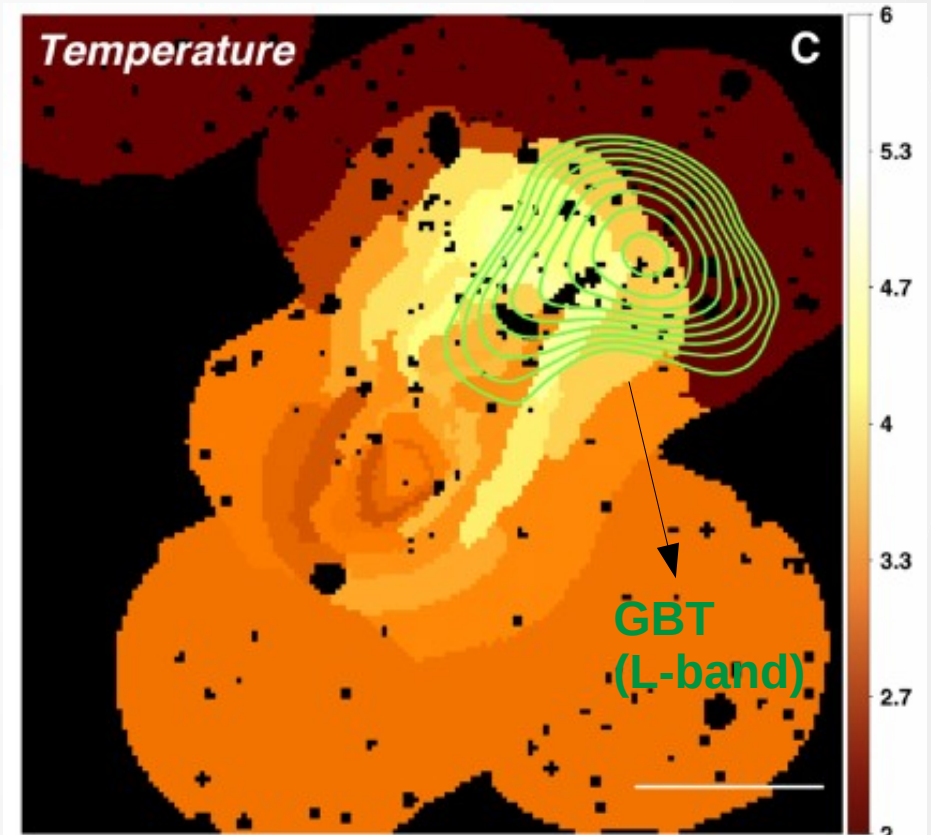
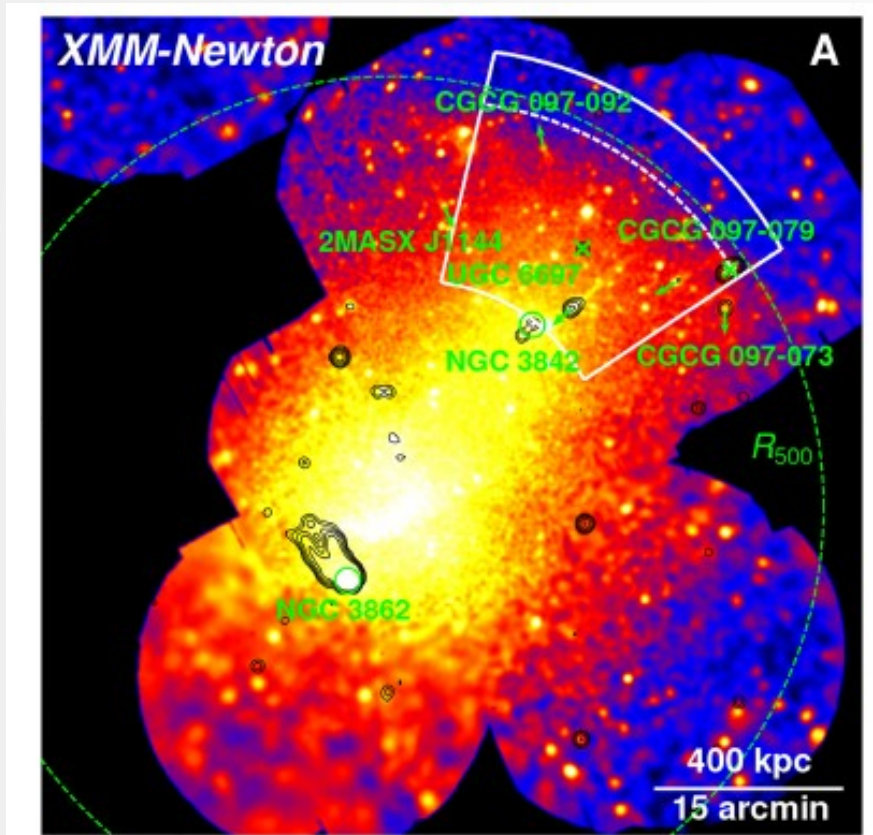
- A1367 is a low mass ($M_{500} \sim 2.3 \times 10^{14} M_{\text{sun}}$) nearby cluster at a redshift of 0.022
- It lies at the intersection of two large filaments, which connect to Virgo and Coma.
- Along with Coma cluster they form the two members of the Coma supercluster.

Radio relic candidate in A1367



- Diffuse radio emission observed in the periphery.
- ~ 230 mJY detection. 18 arcmin in size.
- Difficult for interferometric observations.

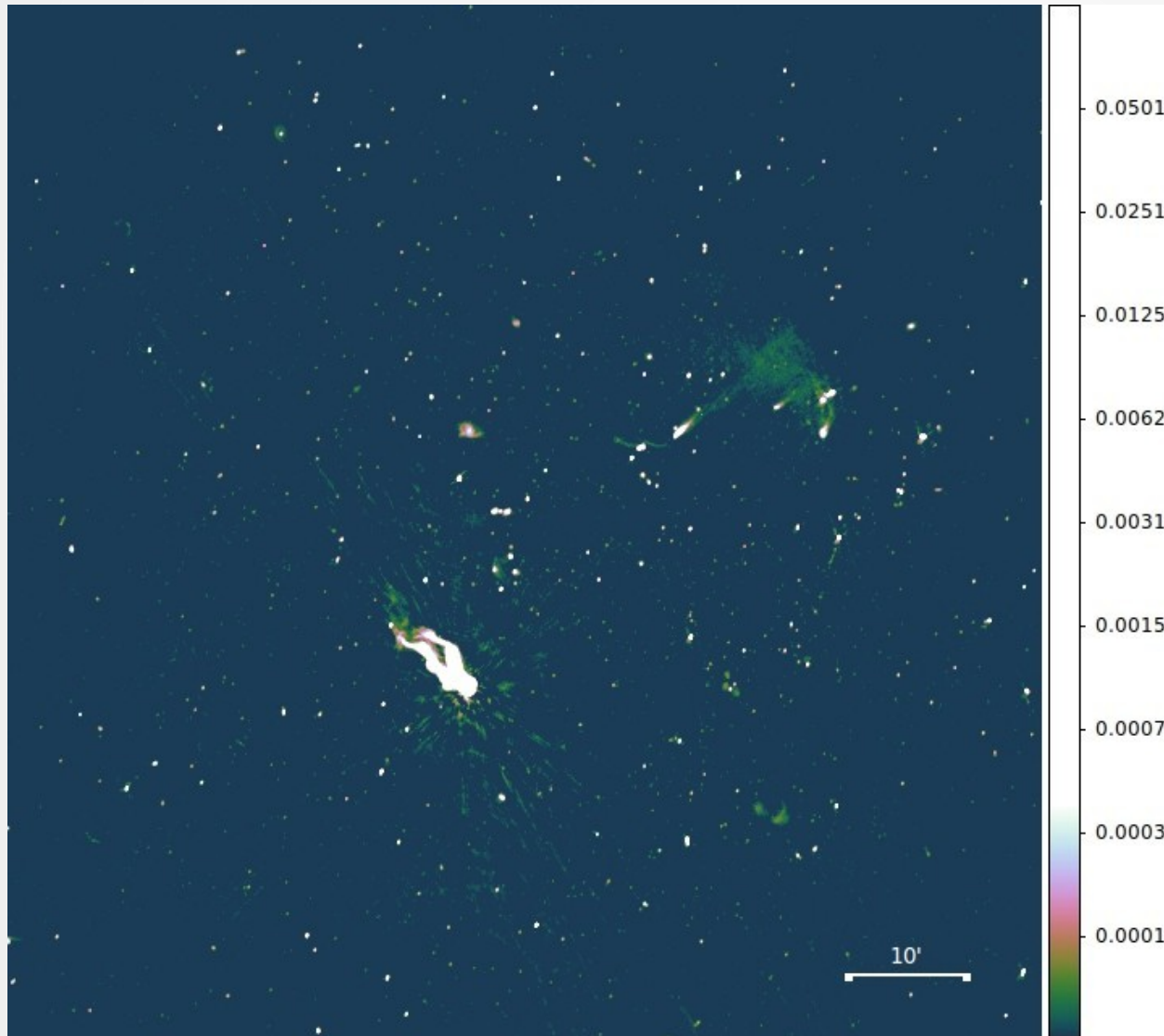
A weak shock in A1367



Ge et al. 2019

- The Mach number of the shock is $M \sim 1.6$.
- Assuming the subcluster moves at the shock velocity and merger in the plane of the sky, the two subcluster passed through each other 0.7 Gyr ago.

MeerKAT image

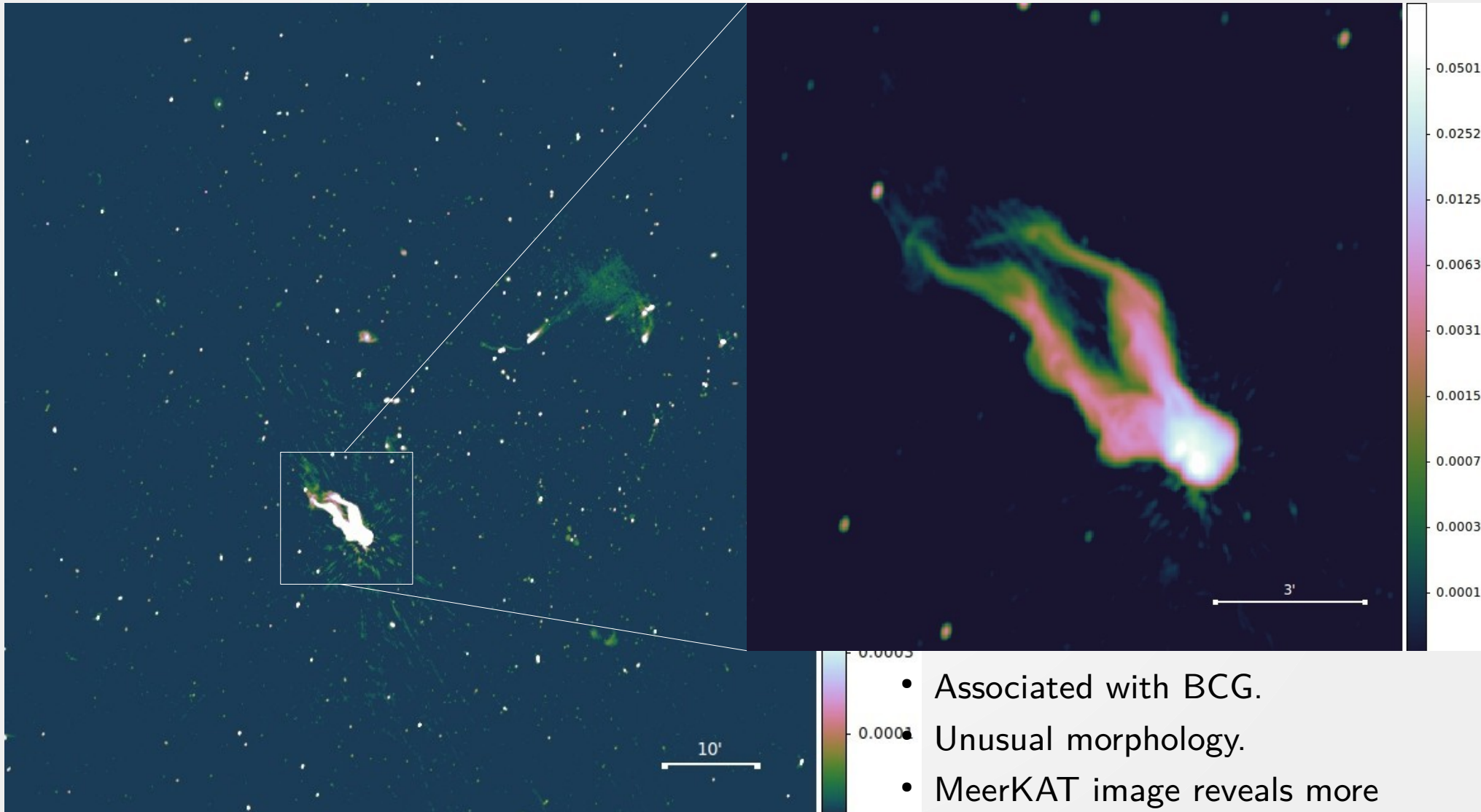


- We have observed A1367 cluster with MeerKAT in L-band for 4 hours on target.
- CARACal pipeline was used for the data reduction.

rms = 12 μ Jy/beam

Beam = 9" \times 5"

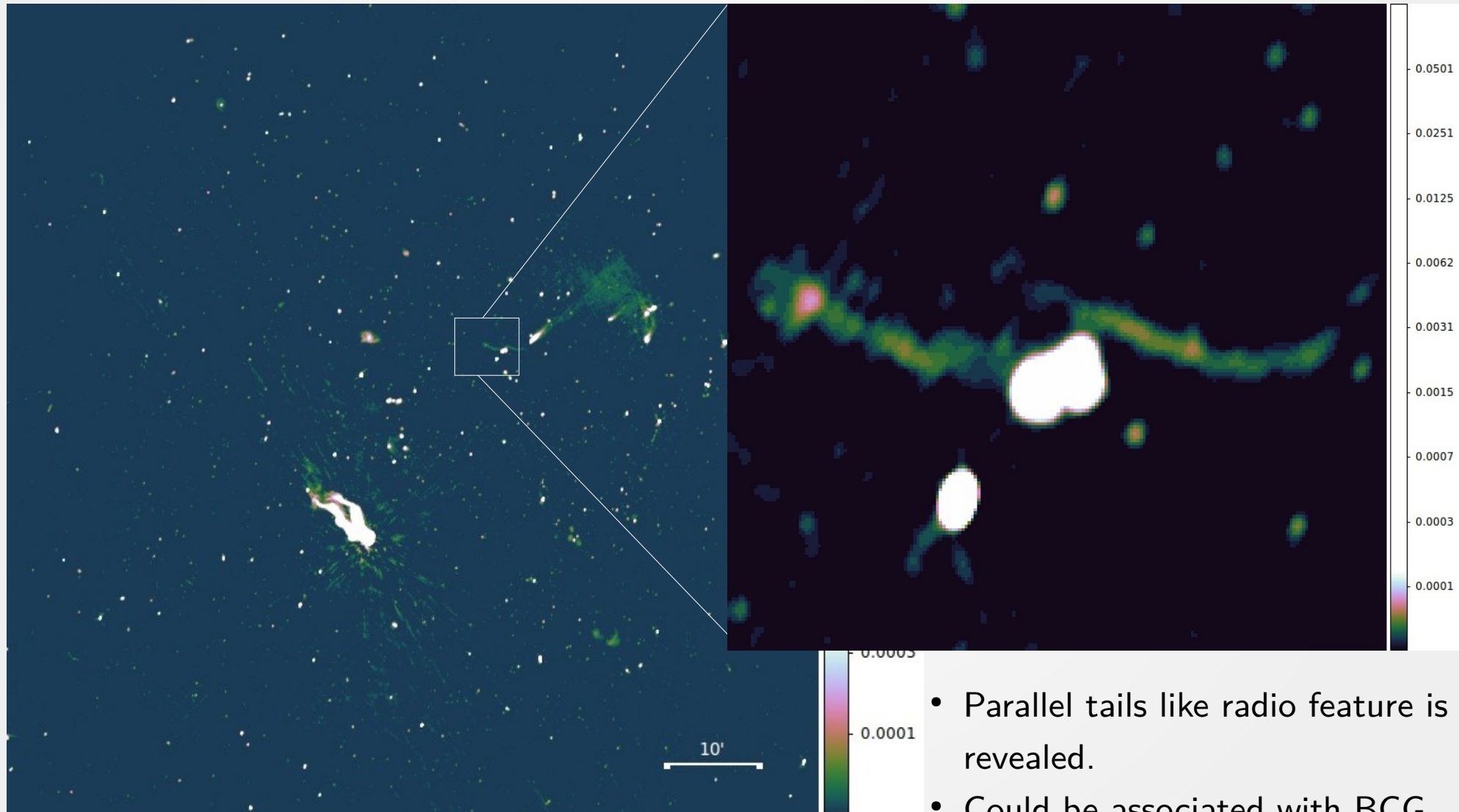
3C264



rms = 12 μ Jy/beam
Beam = 9" \times 5"

- Associated with BCG.
- Unusual morphology.
- MeerKAT image reveals more extended twin tails with filamentary structures.

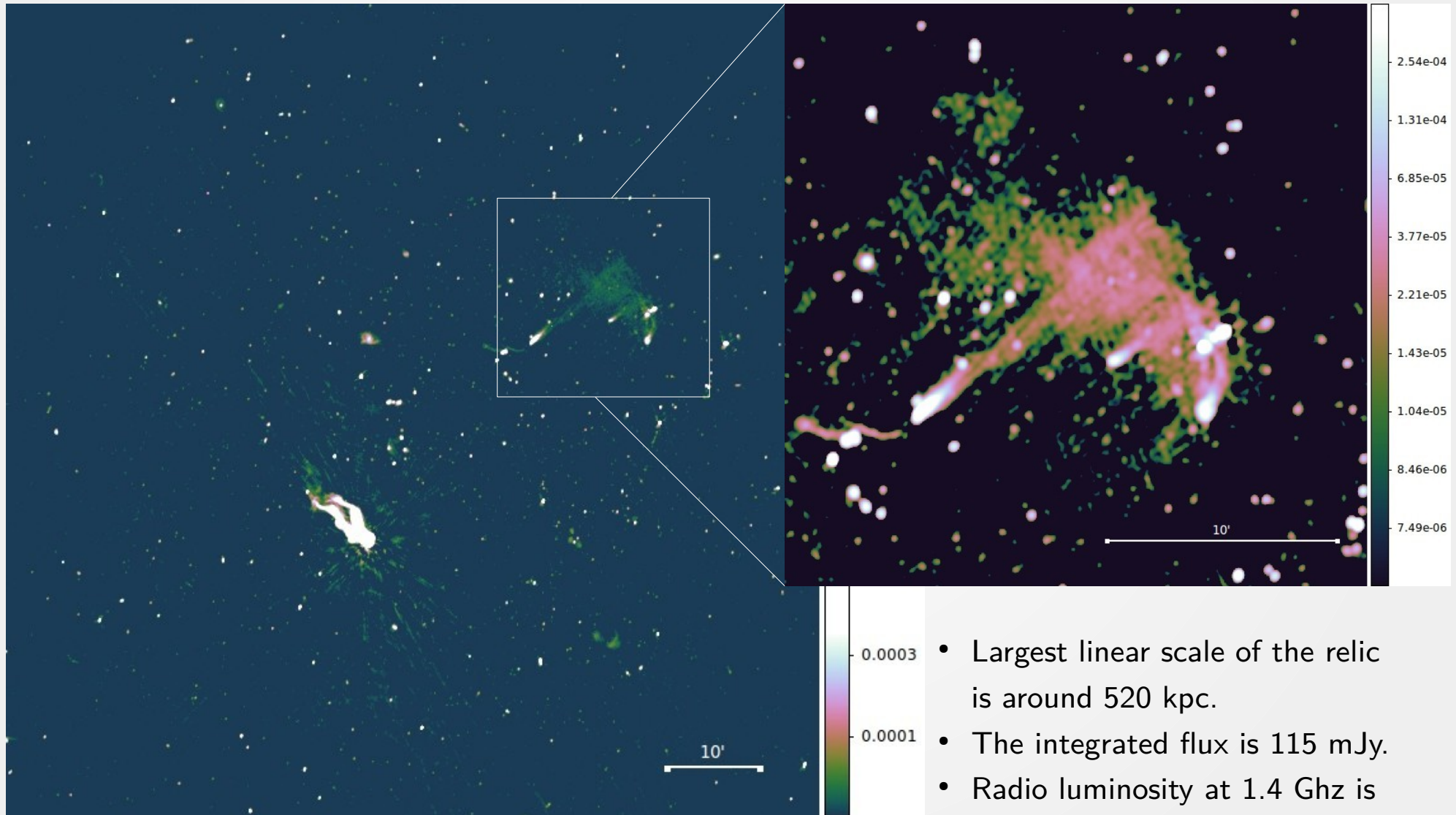
Enigmatic parallel tails



rms = 12 μ Jy/beam
Beam = 9" \times 5"

- Parallel tails like radio feature is revealed.
- Could be associated with BCG.
- Morphologically hard to interpret.

Relic

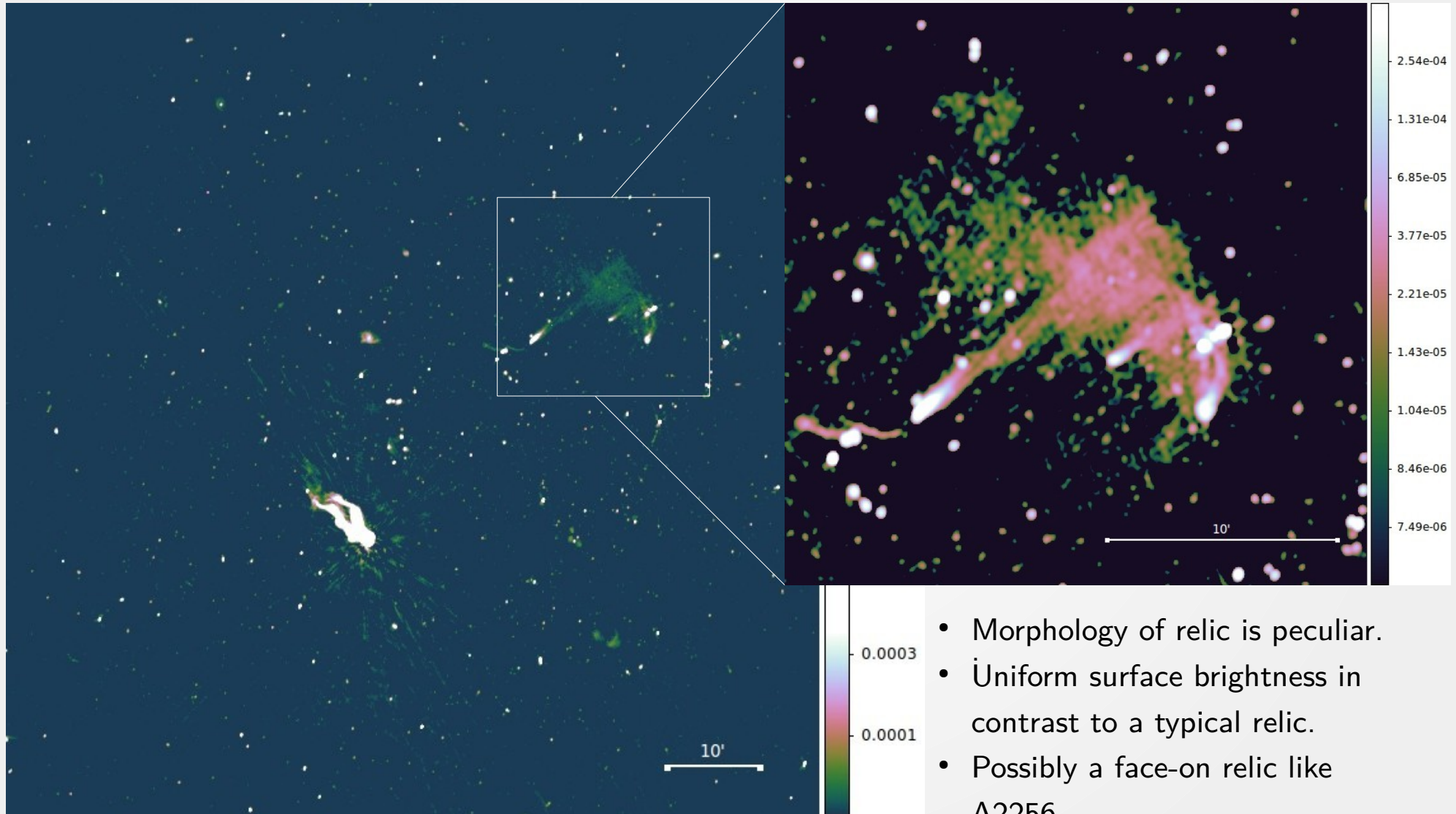


rms = 12 μ Jy/beam

Beam = 9" \times 5"

- Largest linear scale of the relic is around 520 kpc.
- The integrated flux is 115 mJy.
- Radio luminosity at 1.4 GHz is 1.3×10^{24} W/Hz
- Agrees with the mass-luminosity correlation for relics.

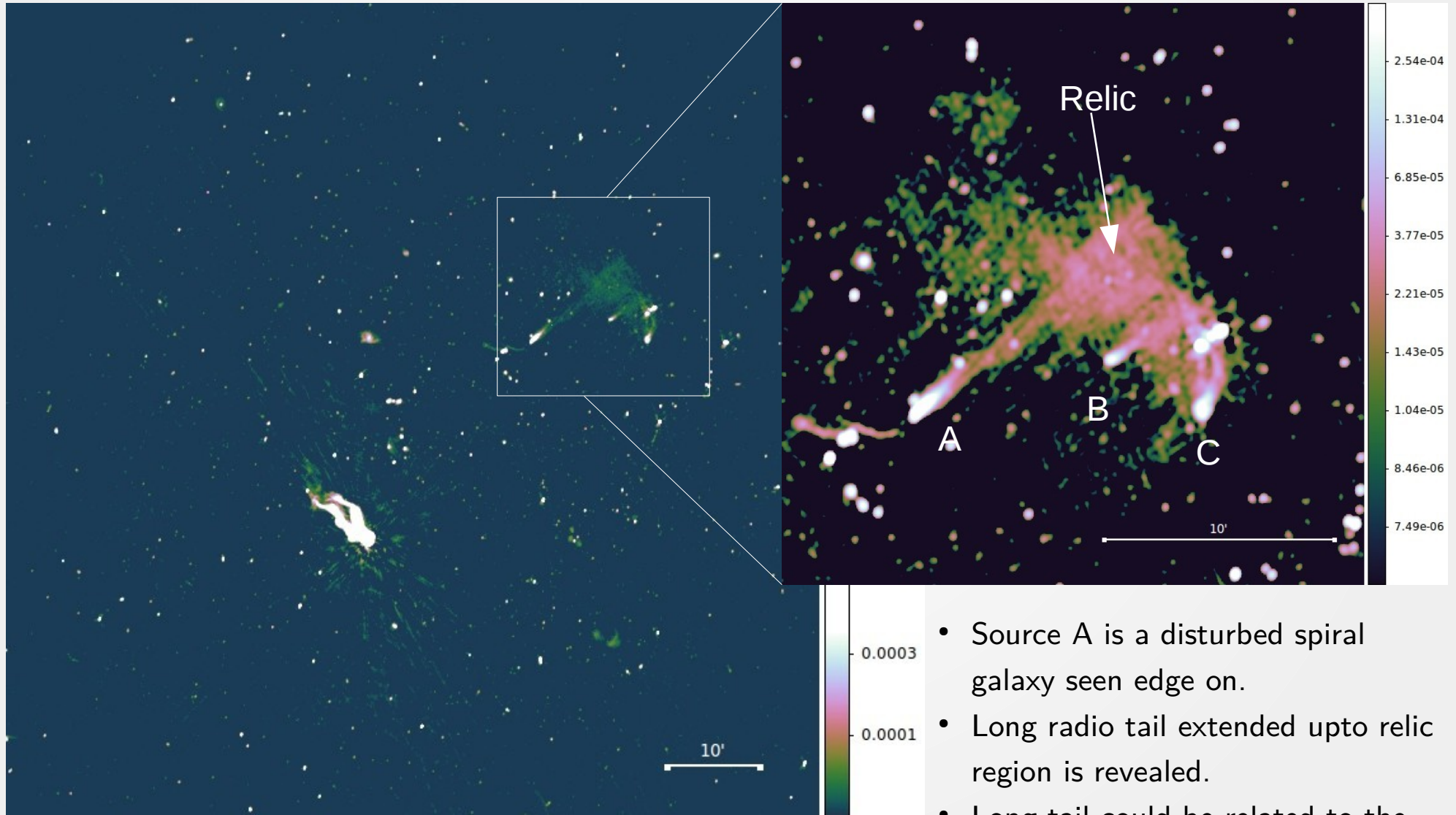
Cluster radio relic?



rms = 12 μ Jy/beam
Beam = 9" \times 5"

- Morphology of relic is peculiar.
- Uniform surface brightness in contrast to a typical relic.
- Possibly a face-on relic like A2256.
- No filamentary structures in contrast to a typical relic.

Infalling galaxies in A1367



rms = 12 μ Jy/beam
Beam = 9" \times 5"

- Source A is a disturbed spiral galaxy seen edge on.
- Long radio tail extended upto relic region is revealed.
- Long tail could be related to the presence of the shock.

A: UGC 6697 B: CGCG097-079 C: CGCG097-073

Summary

- MeerKAT observations have confirmed the presence of diffuse emission.
- Classification of the diffuse source as radio relic is uncertain.
- MeerKAT observations have revealed two parallel radio tail like feature near BCG (NGC 3842).
- More extended radio tails of RPS spiral galaxy Source A (UGC 6697).