Tuning the radio in to Cosmology

Meriem Behiri

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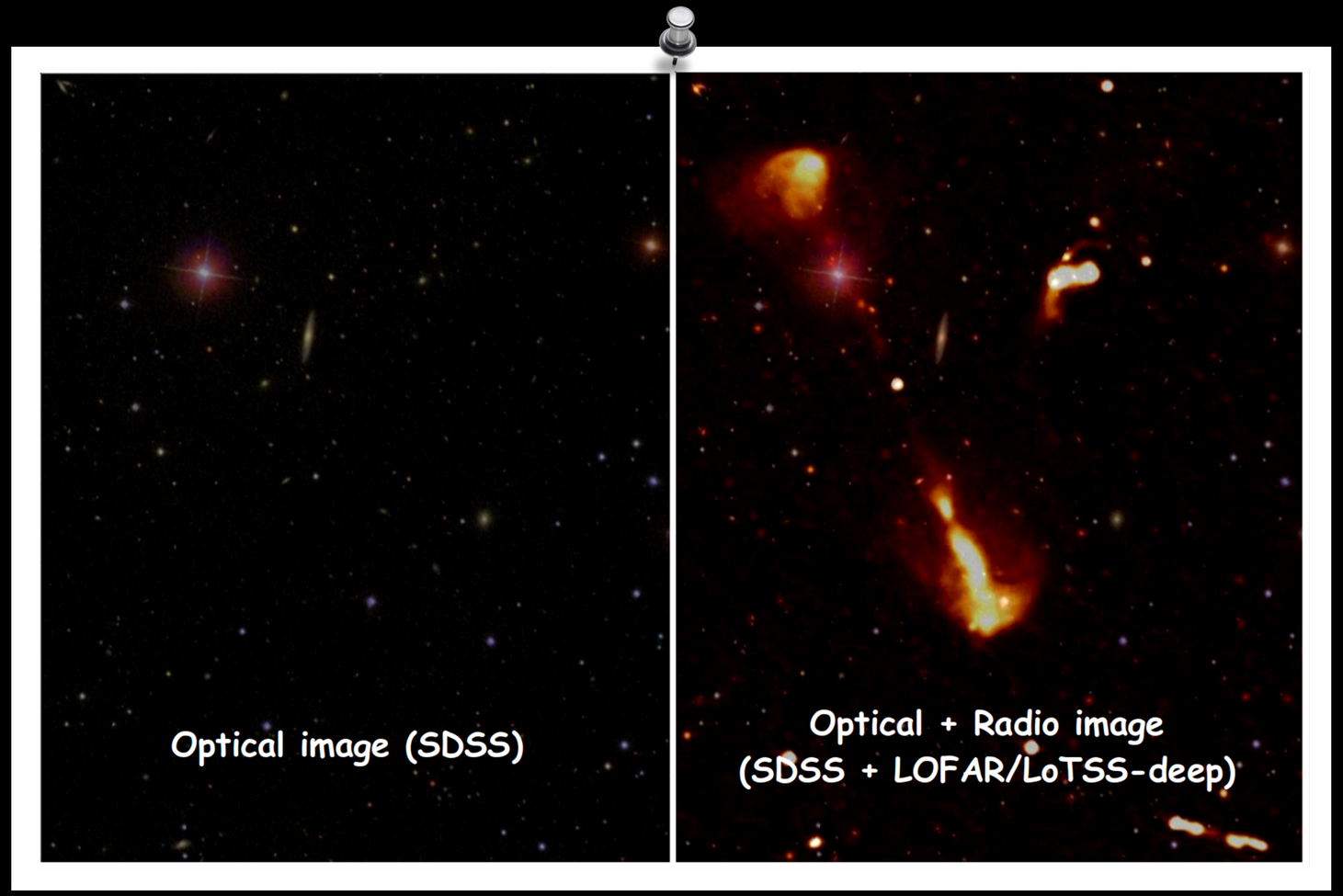
Collaborators: Galluzzi V., Giulietti M., D'Amato Q., Gentile F., Ronconi T., Gandolfi G., Torsello M.

Why should the radio bands interest us?

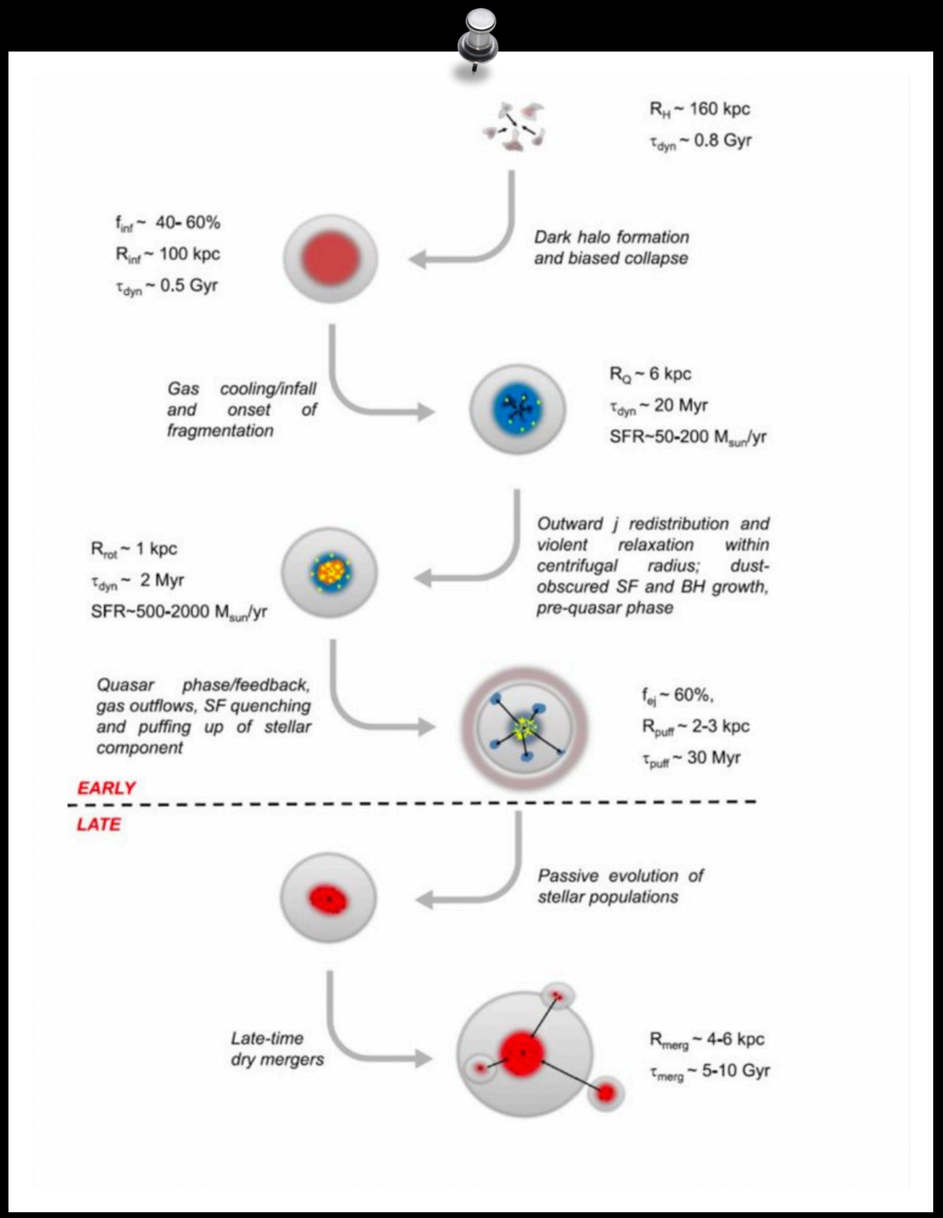
- Going beyond the dust



Credits: NRAO

Why should the radio bands interest us?

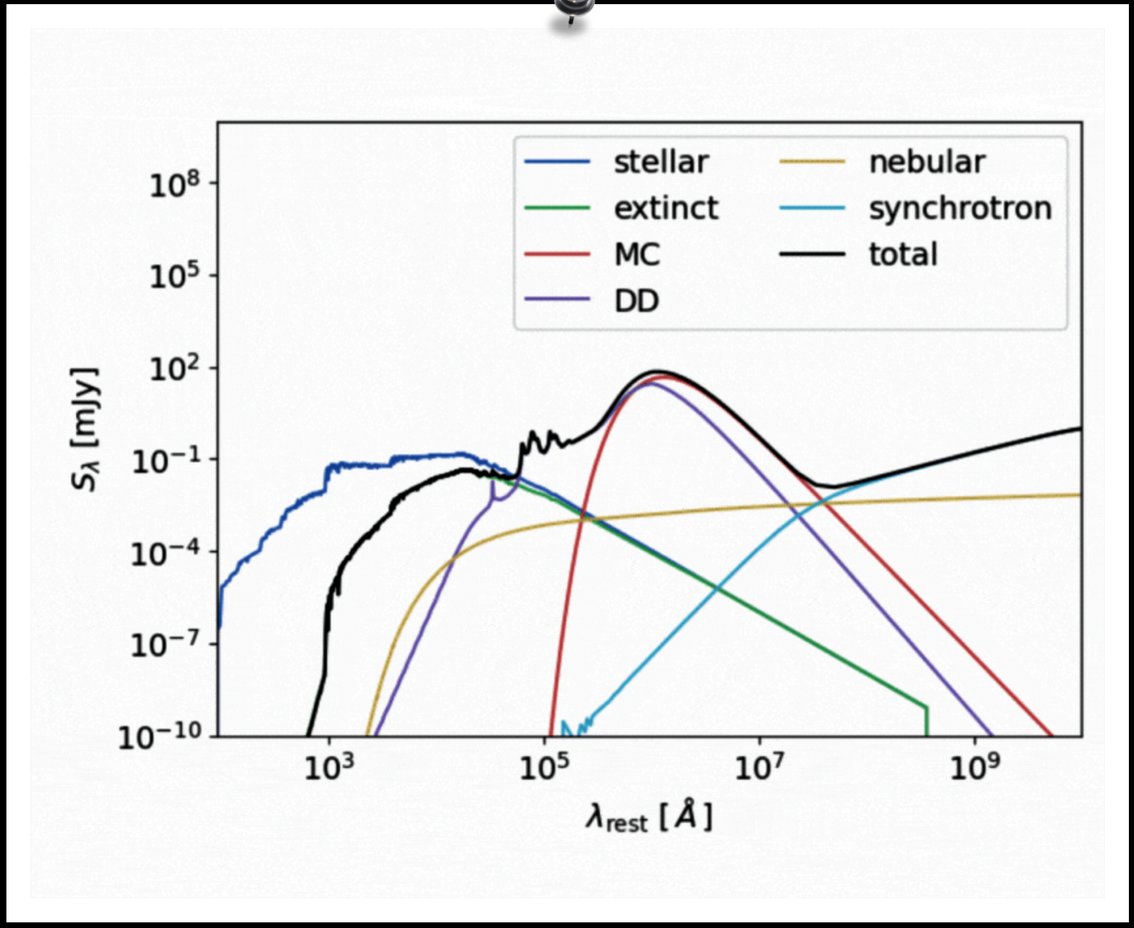
- Going beyond the dust
  - The role of obscured galaxies in galaxy formation



Lapi+18

Why should we care about the radio bands?

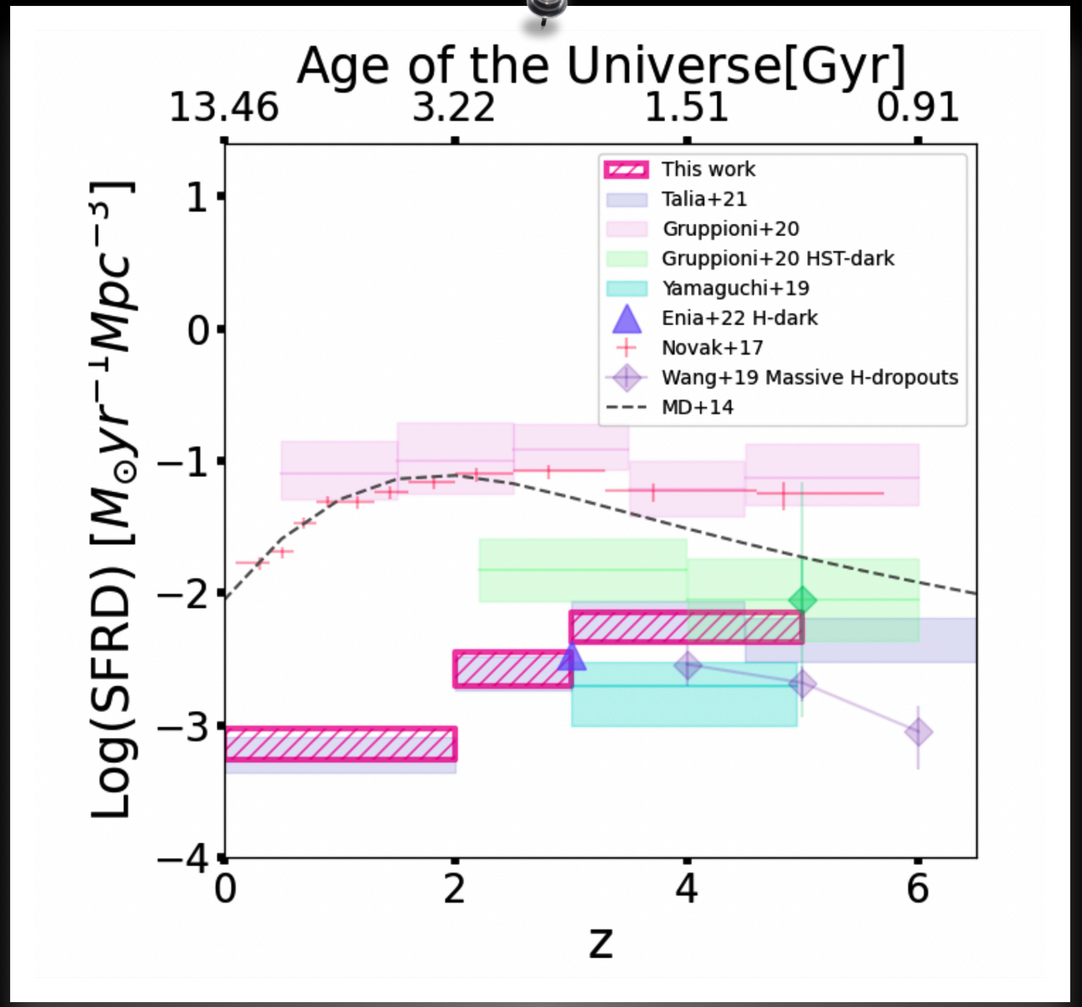
- Going beyond the dust
- A new way to select galaxies populations
  - Disentangle between AGN and SFGs



Courtesy of T. Ronconi

Why should the radio bands interest us?

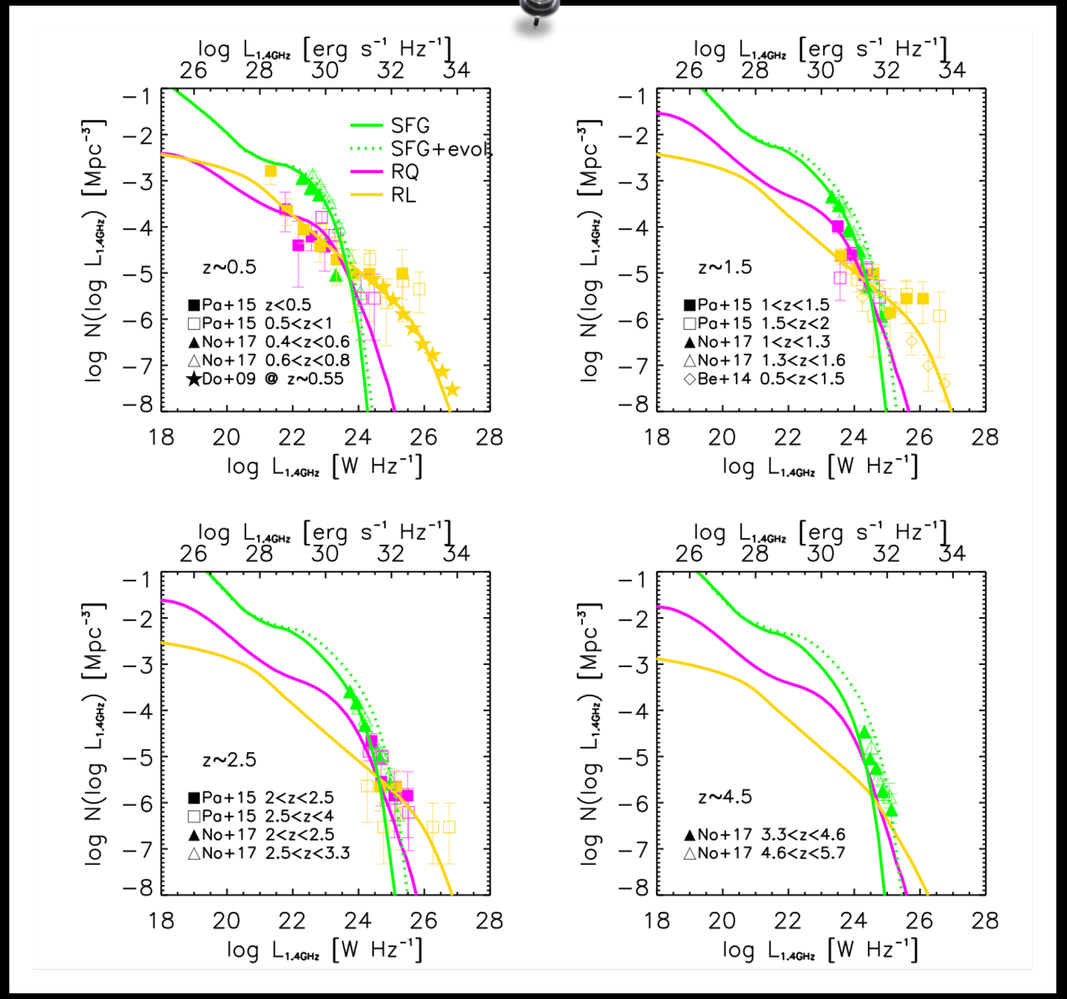
- Going beyond the dust
- A new way to select galaxies populations
  - Disantangle between AGN and SFGs
  - SFRD (Talia+21, Behiri+subm.)



Behiri+subm

Why should the radio bands interest us?

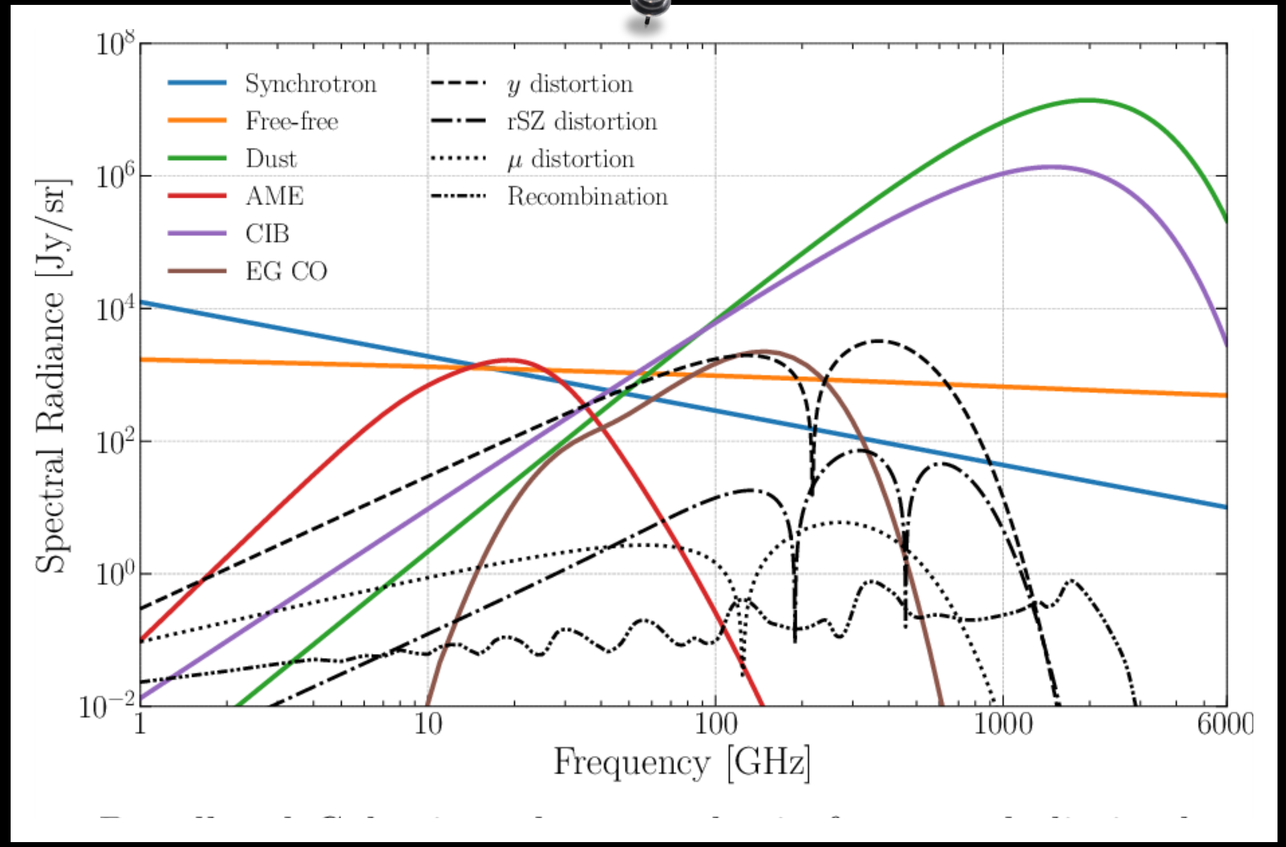
- Going beyond the dust
- A new way to select galaxies populations
  - Disantangle between AGN and SFGs
  - SFRD (Talia+21, Behiri+23)
  - Luminosity function and number counts



Mancuso+17

Why should the radio bands interest us?

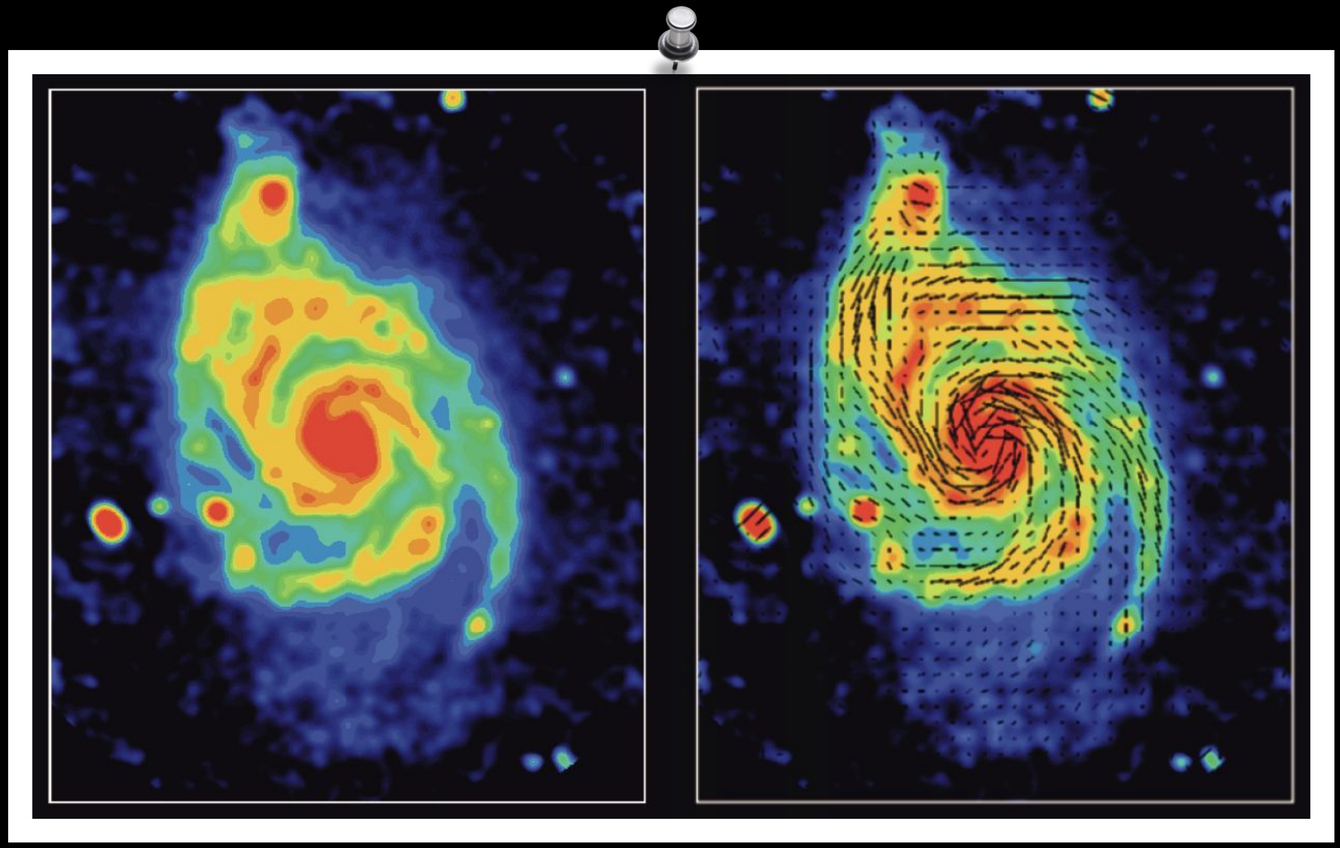
- Going beyond the dust
- A new way to select galaxies populations
- Characterizing CMB foreground by SFGs and AGN



Kogut+2019

Why should the radio bands interest us?

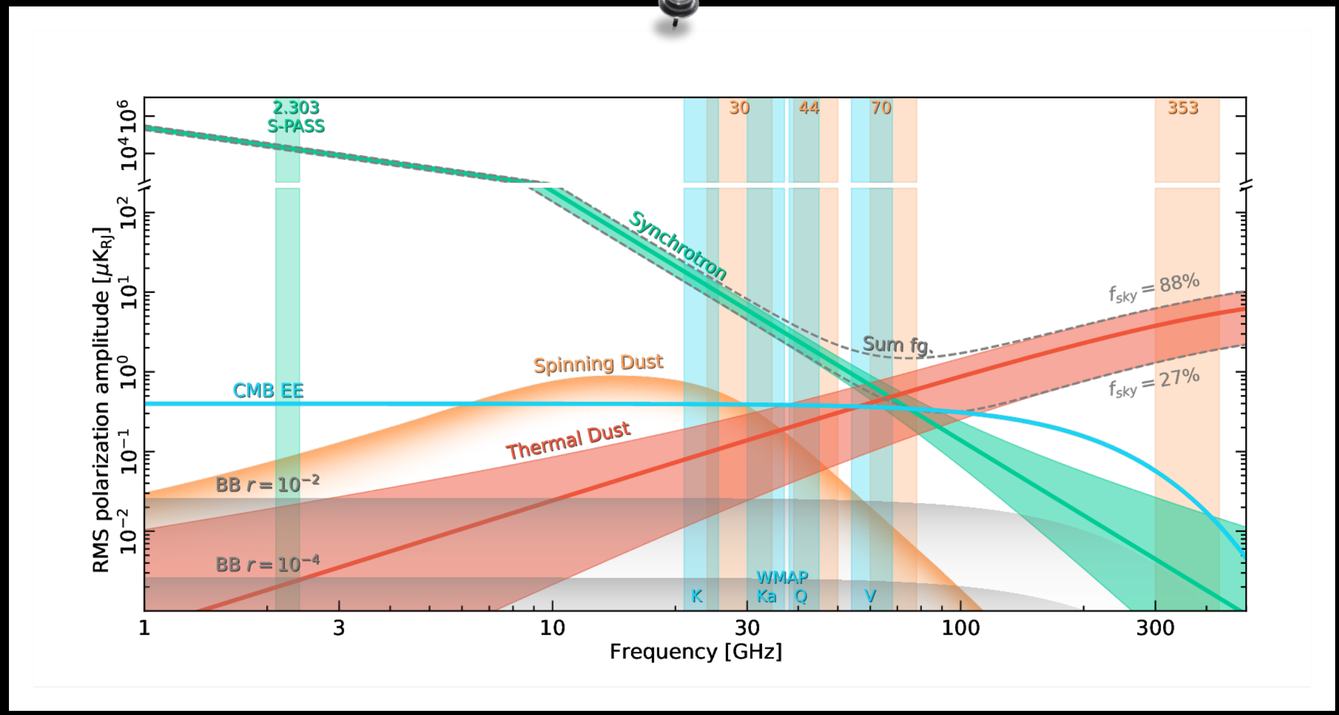
- Going beyond the dust
- A new way to select galaxies populations
- Characterizing CMB foreground by SFGs and AGN
- Polarization studies
  - Understanding the polarization of SFG and AGN



Credits: NRAO

Why should the radio bands interest us?

- Going beyond the dust
- A new way to select galaxies populations
- Characterizing CMB foreground by SFGs and AGN
- Polarization studies
  - Polarization of SFG and AGN
  - Polarization foreground for CMB



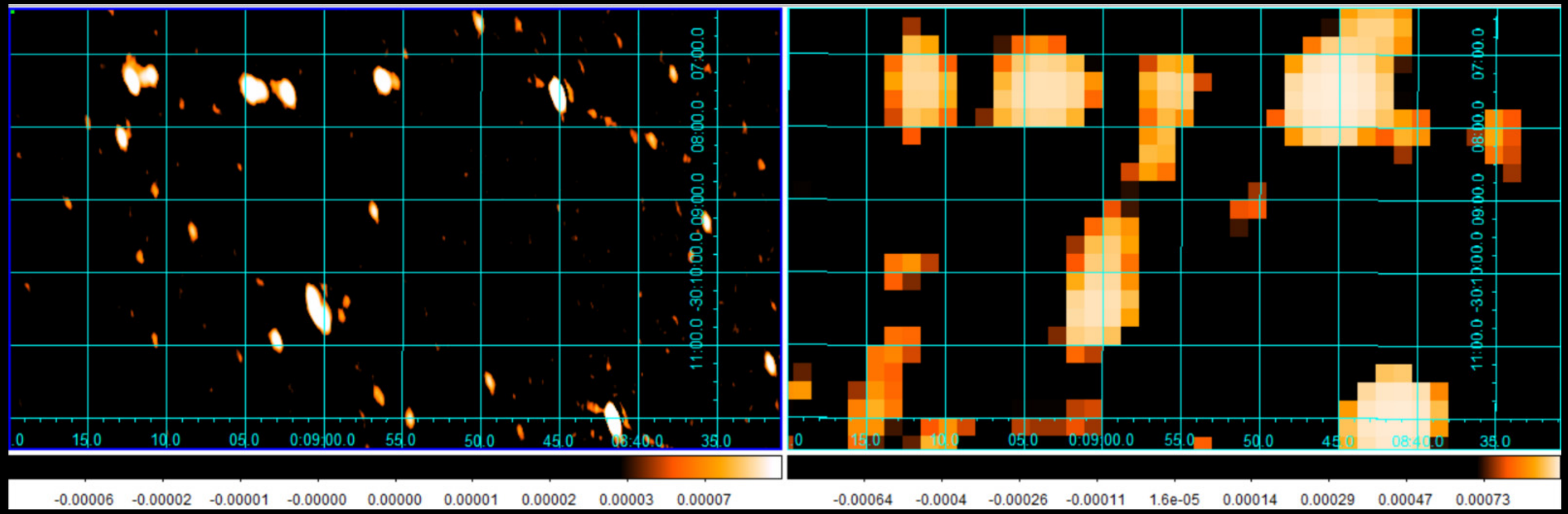
Herman+22

The advantages of radio observations

- Not affected by extinction
- No dust-temperature biases
- Wide fields
- Interferometry
- Getting ready for SKAO

SHORES

A brand new survey

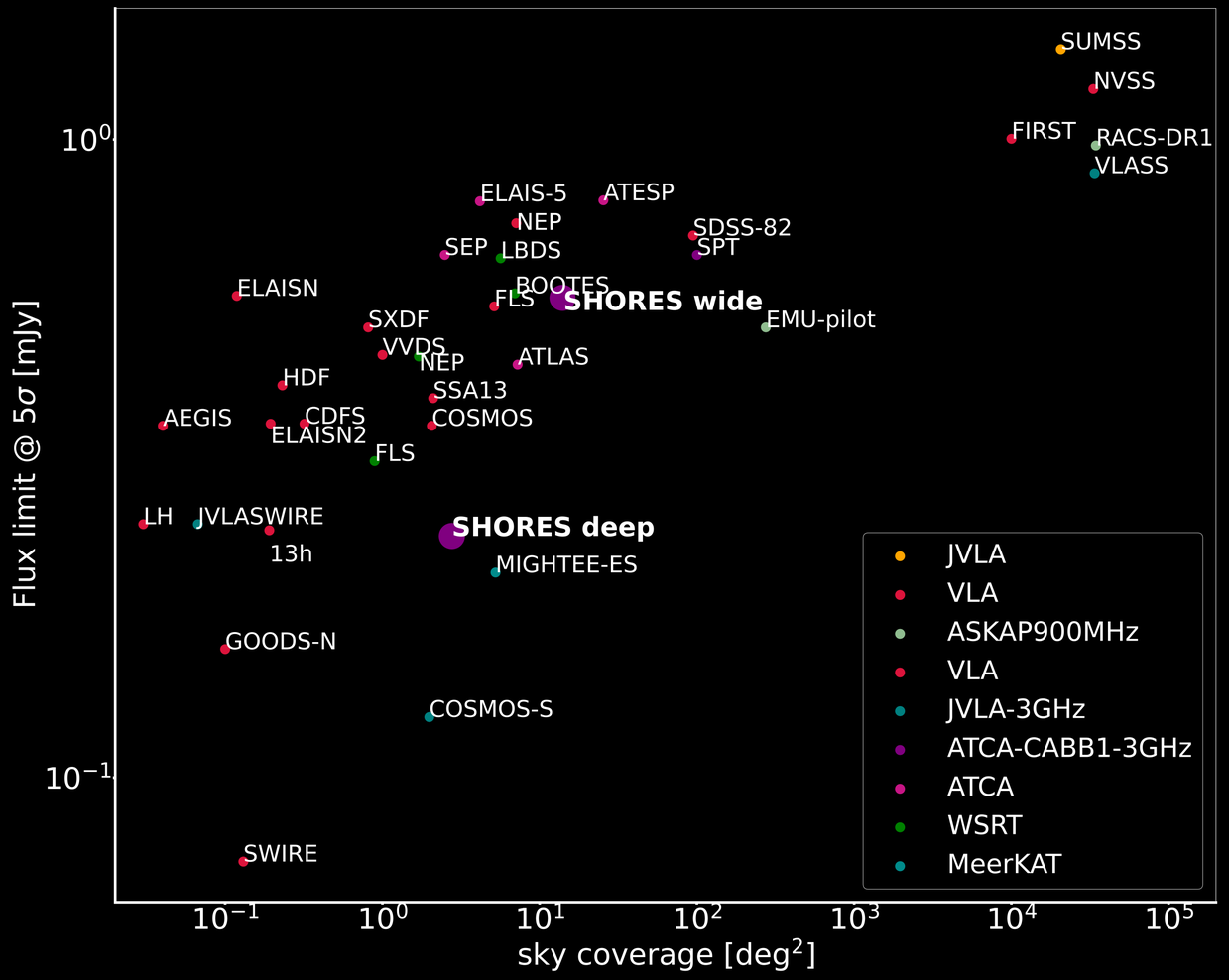


SHORES vs NVSS

SHORES

Features

- Observed with ATCA at 2.1 GHz

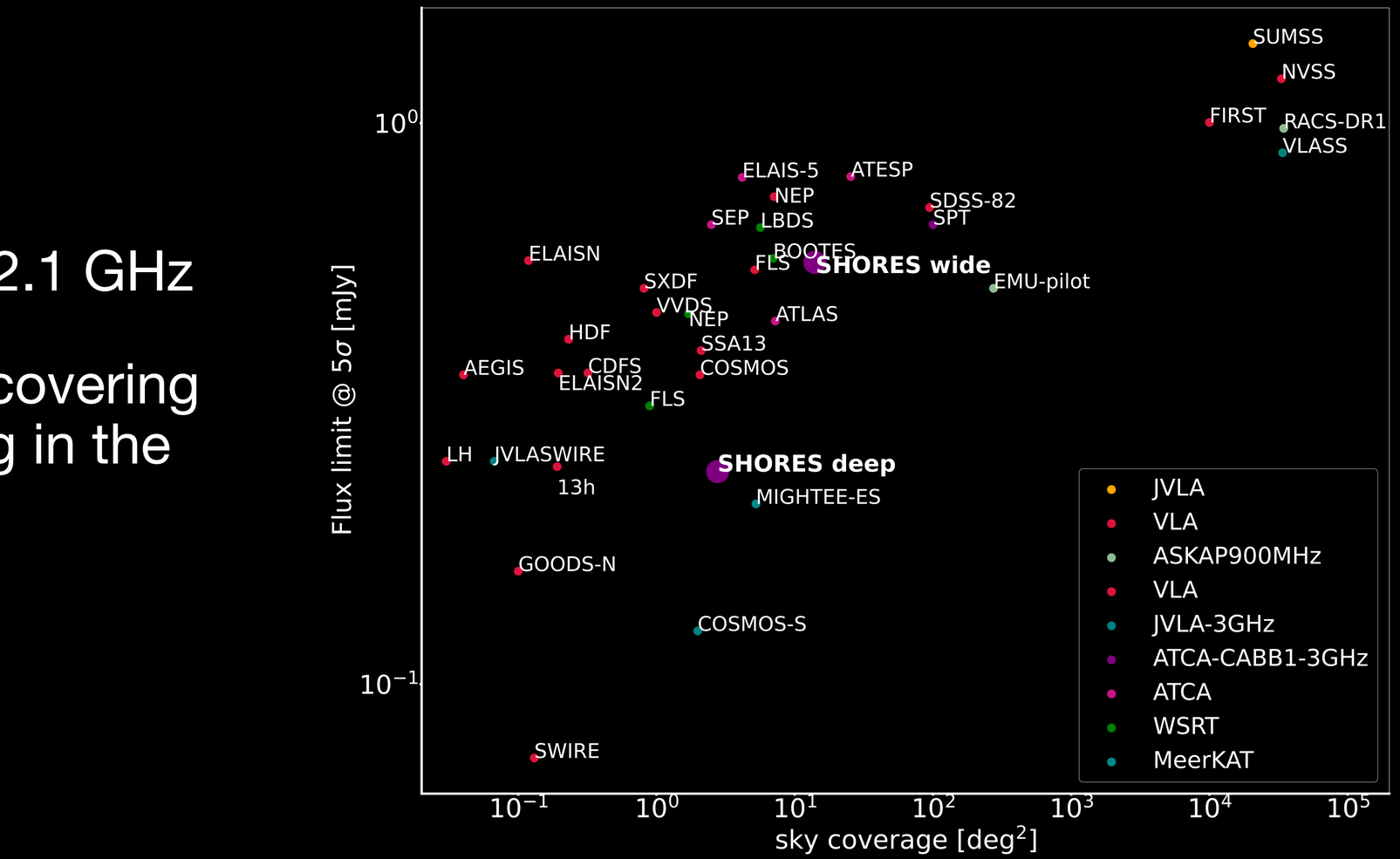


Behiri+, in prep.

SHORES

Features

- Observed with ATCA at 2.1 GHz
- 30 discontinuous fields covering a total area of 15 sq. deg in the H-ATLAS field sgp

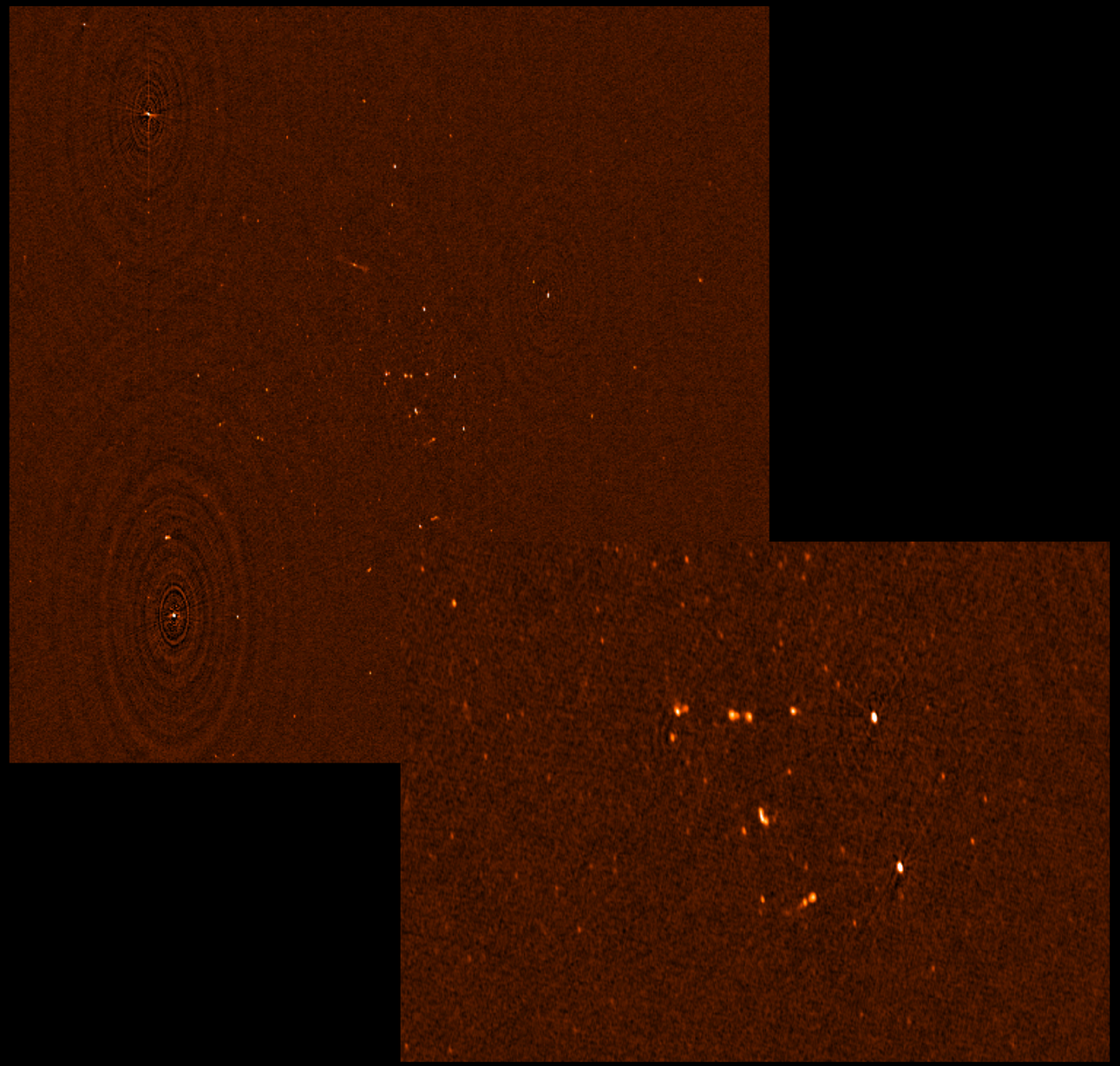


Behiri+, in prep.

SHORES

Features

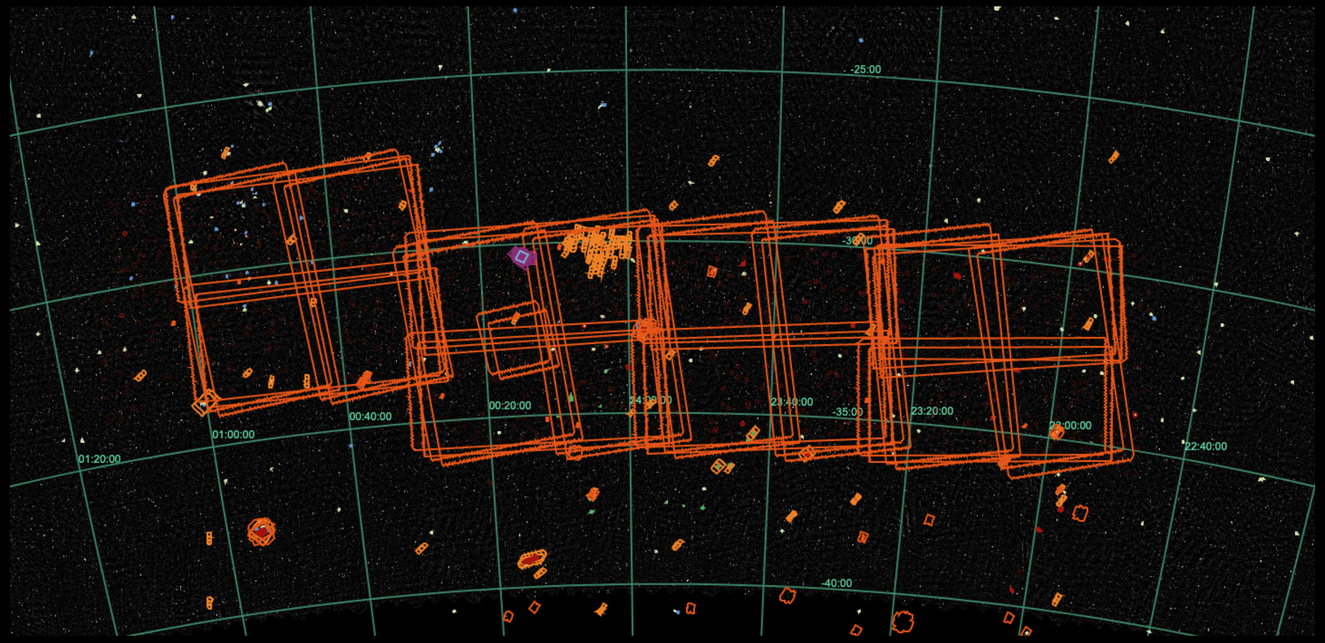
- Observed with ATCA at 2.1 GHz
- 30 discontinuous fields covering a total area of 15 sq. deg in the H-ATLAS field sgp
  - One deep field
    - Rms 13 μJy
    - Follow-ups at 5.5, 9 and 20 GHz



SHORES

Features

- Observed with ATCA at 2.1 GHz
- 30 discontinuous fields covering a total area of 15 sq. deg in the H-ATLAS field sgp
- Panchromatic coverage
  - Herschel
  - ALMA
  - HST
  - Spitzer
  - **Euclid**
  - KIDS
  - DES

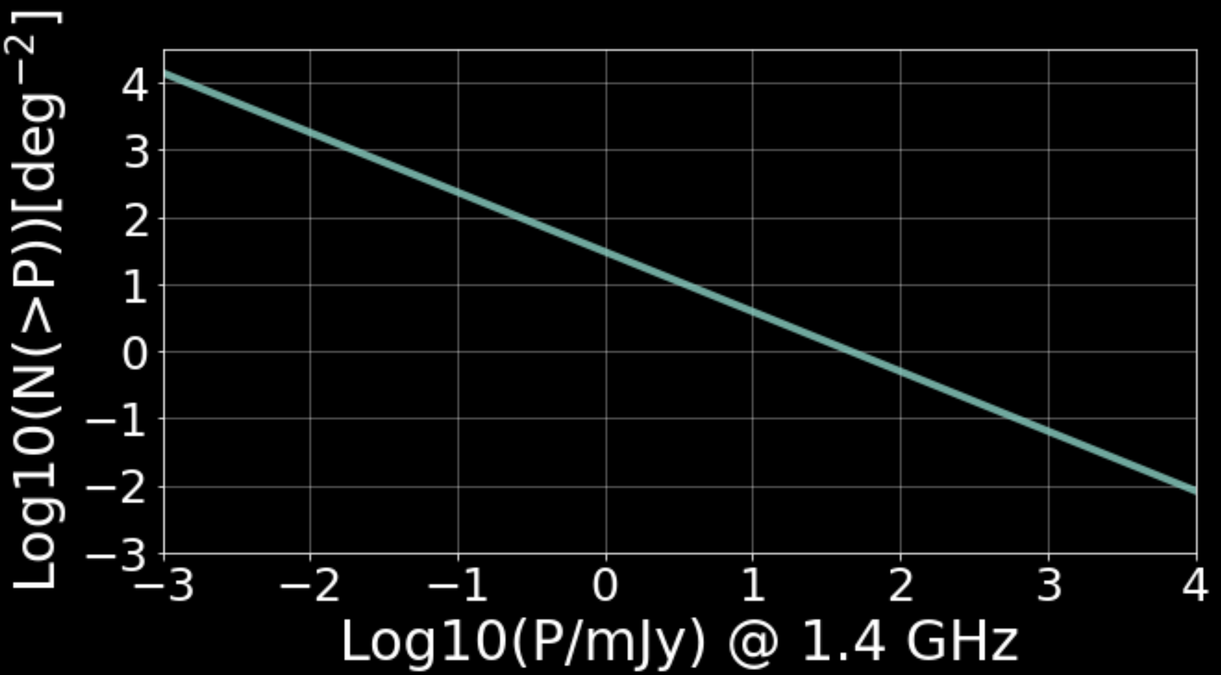


Credits: ESA sky

SHORES

Polarization and cosmological implications

- We observed SHORES in polarization
  - Polarized calibrators
  - Over 200 hours of observations



Integrated number counts in polarization (Adapted from Loi+19)

SHORES

Polarization and cosmological implications

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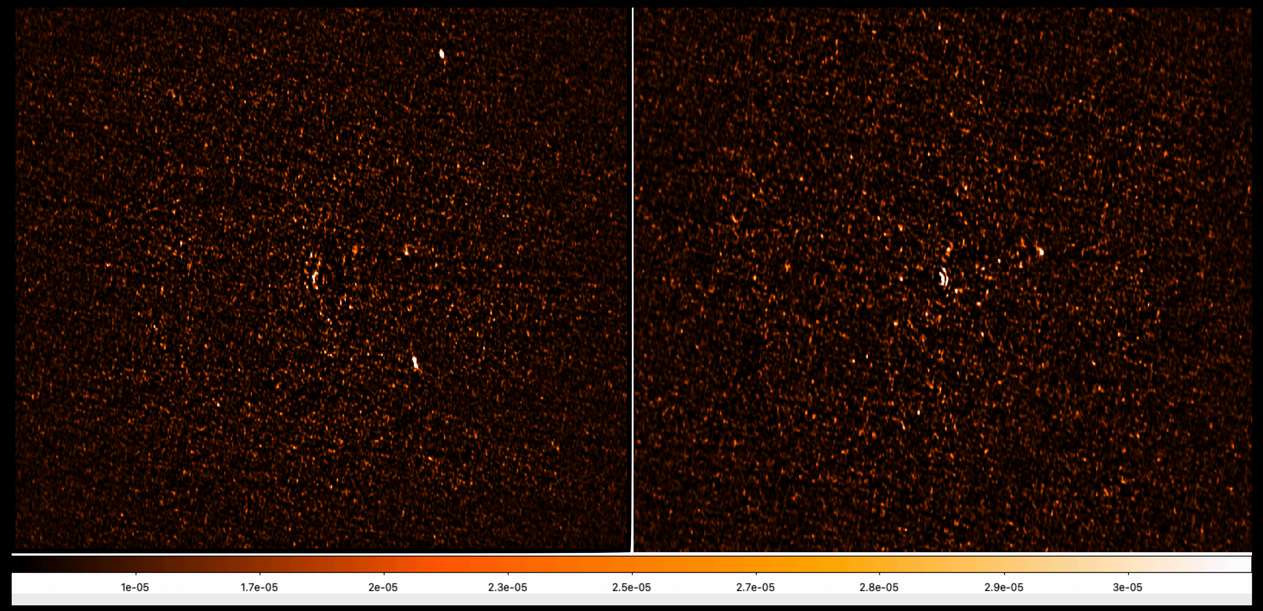
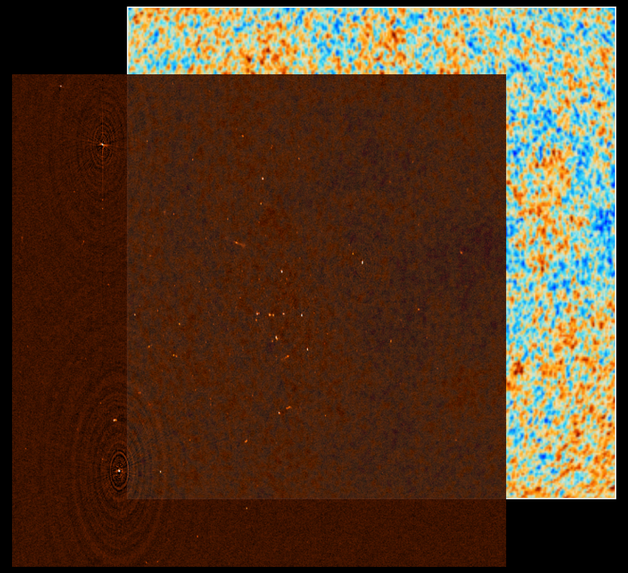
  - Polarized calibrators
  - Over 200 hours of observations
  - Rms in Q and U maps of 5.8 μJy



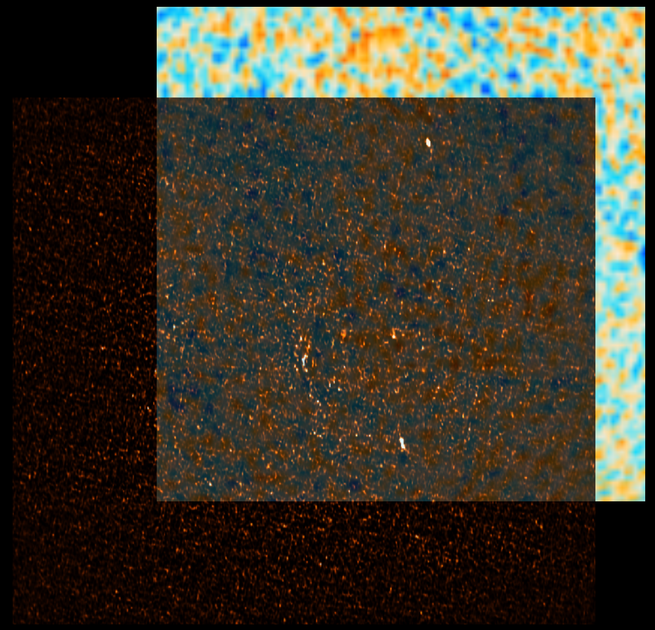
SHORES

Polarization and cosmological implications

- We observed SHORES in polarization
- The extragalactic foreground



I

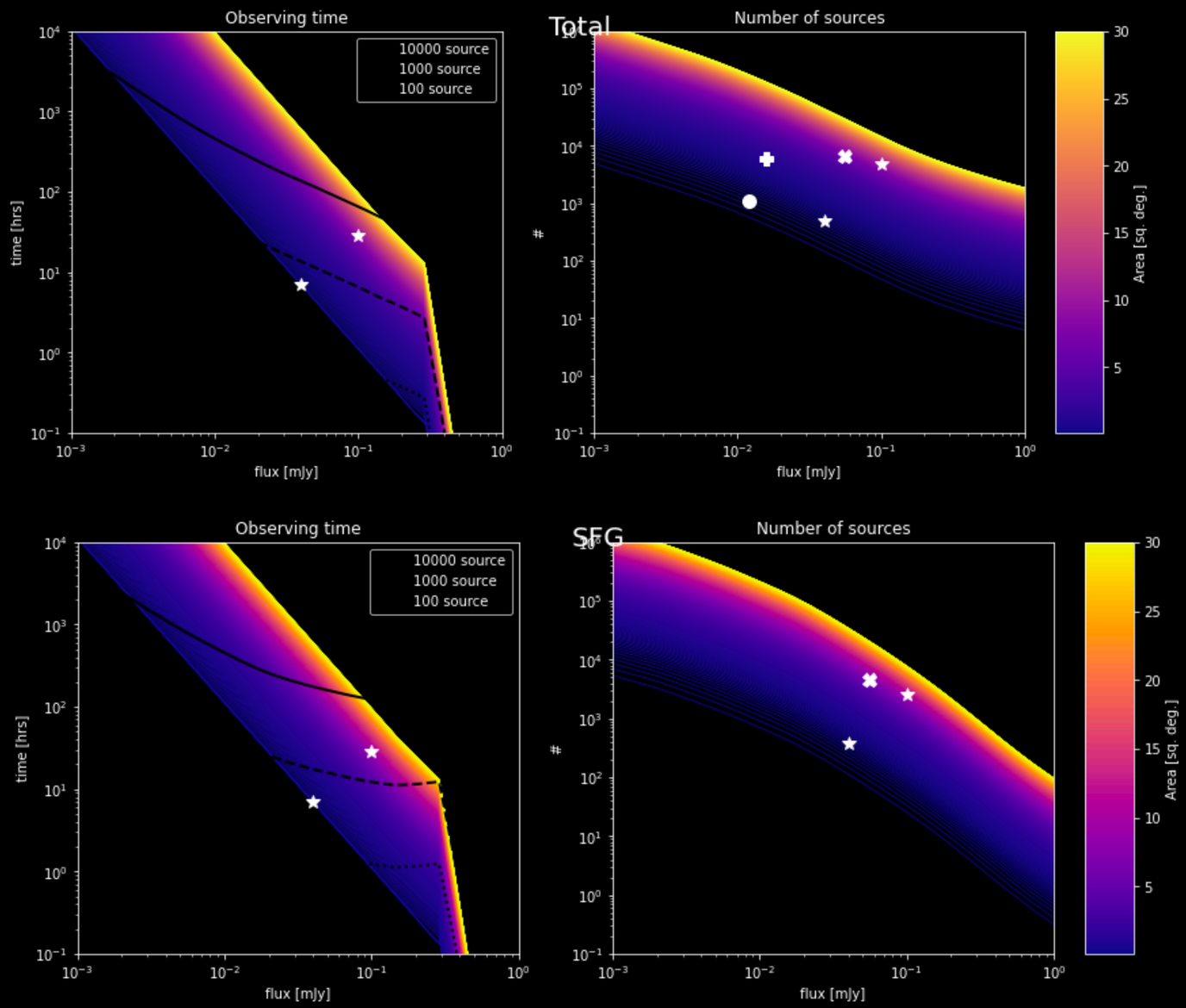


Q

SHORES

Polarization and cosmological implications

- We observed SHORES in polarization
- The extragalactic foreground
- The advantages of a wide area and data
  - Cosmic variance
  - More sources
  - Higher completeness



SHORES

Polarization and cosmological implications

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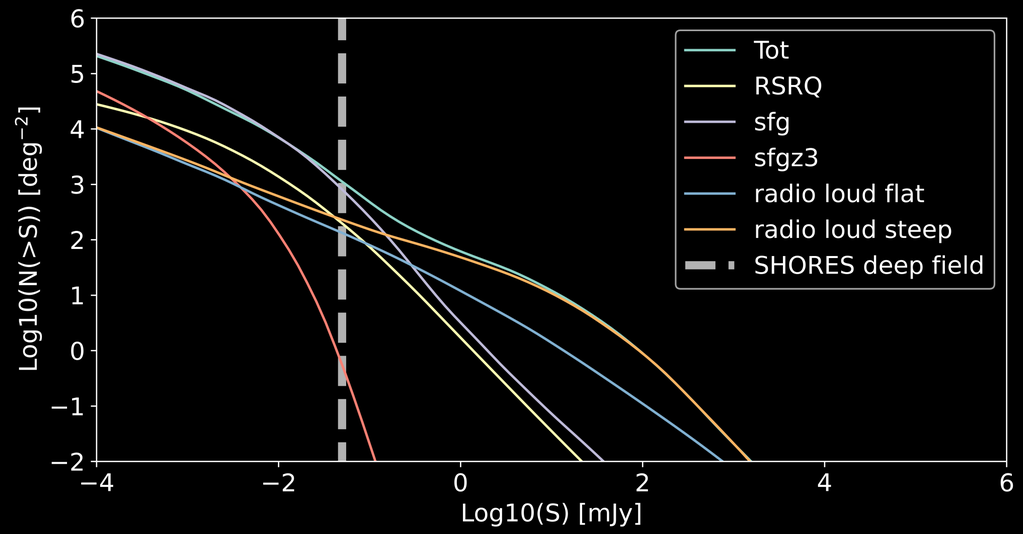

Behiri+, in prep.

Future perspectives:

- Publication of the catalogue of SHORES
- Multiwavelength analysis and SED-fitting
- Number counts and radio luminosity function
- Polarization of SHORES sources
- SHORES sources as foreground