ACT Observations of the Galactic Center

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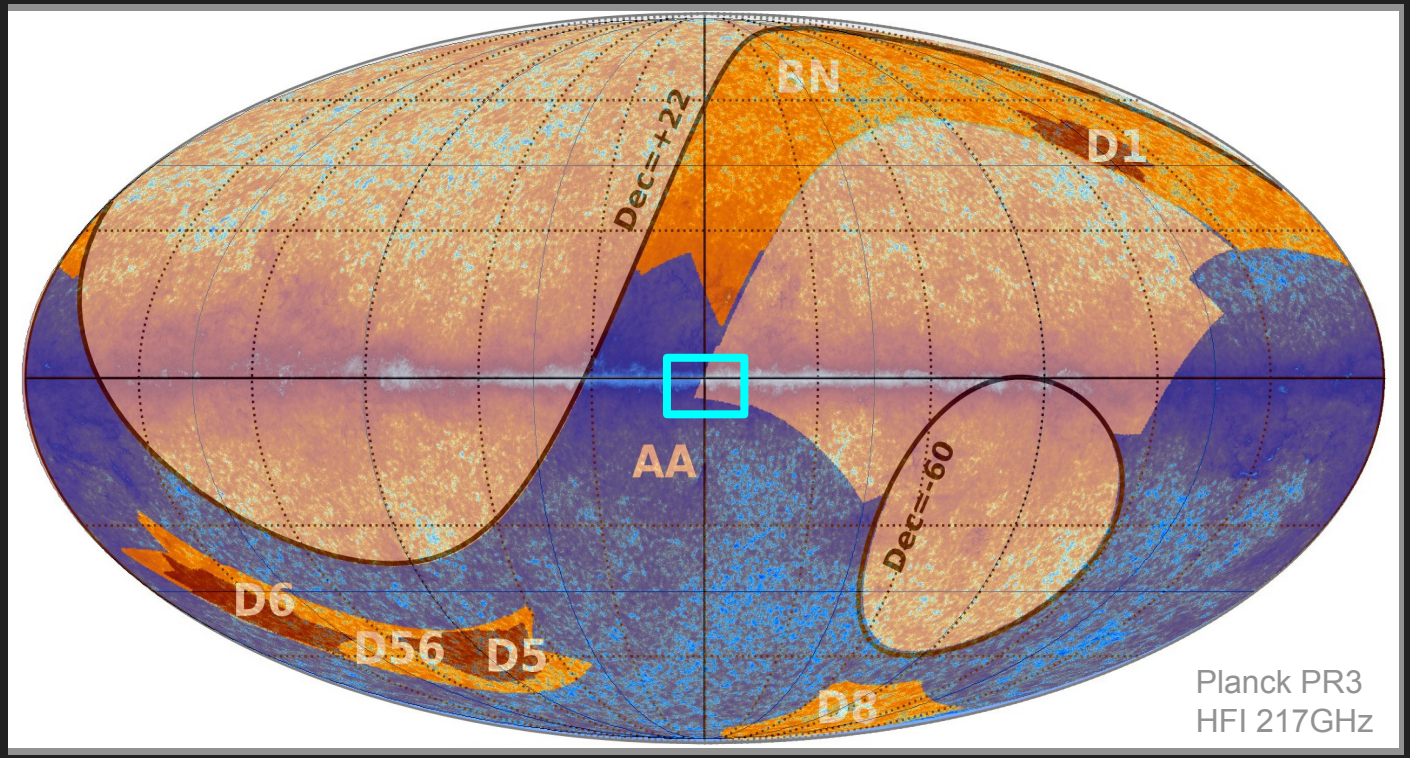
and the ACT Collaboration

Motivations

- Galactic center region in Milky way is physically rich and extreme environment
  - Densest concentration of molecular gas
  - Surprisingly low star formation rate
  - Supermassive blackhole Sgr A*, magnetar, ++
- Targets of multifrequency observations
  - Observations at microwave frequencies are often limited in one of
    - Field of view
    - Angular resolution
    - Polarization sensitivity
- Map galactic center region with ACT

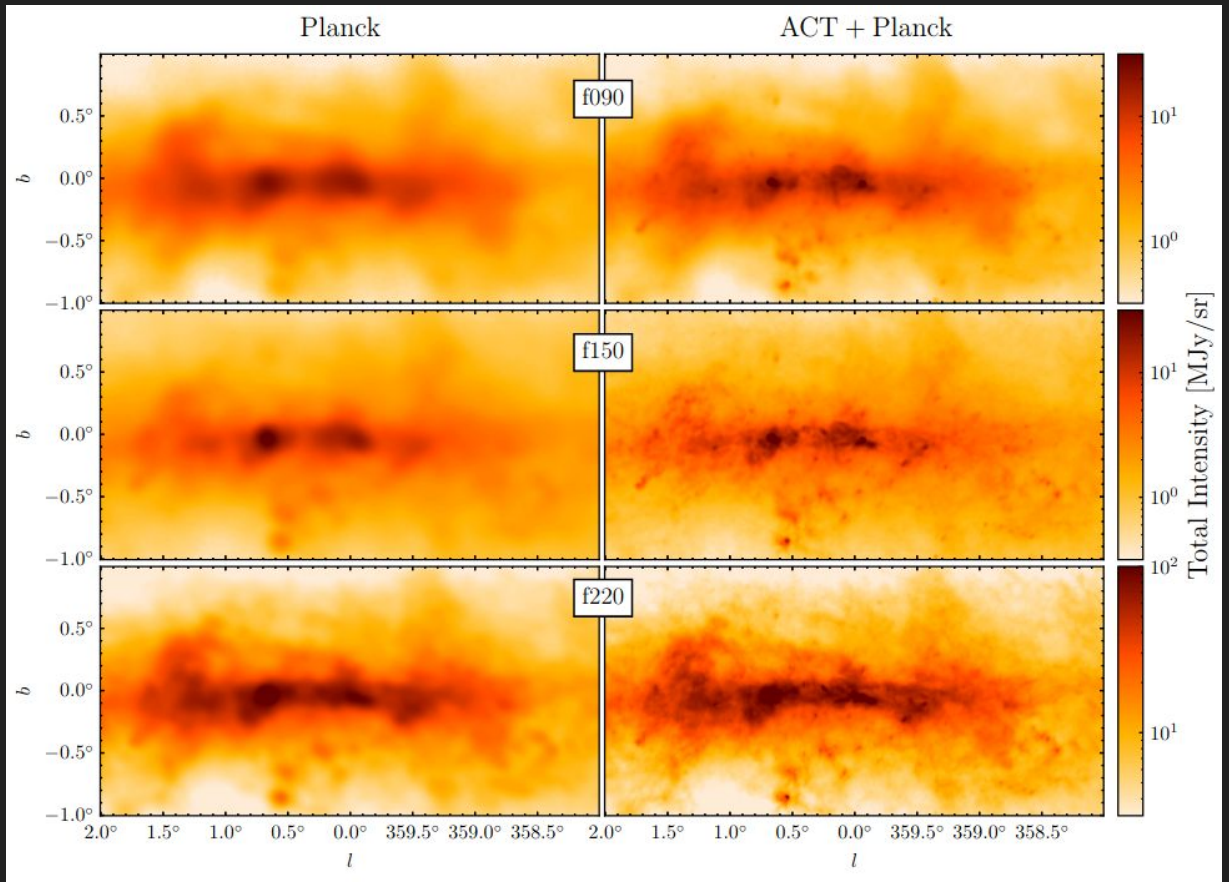
Galactic Center Survey



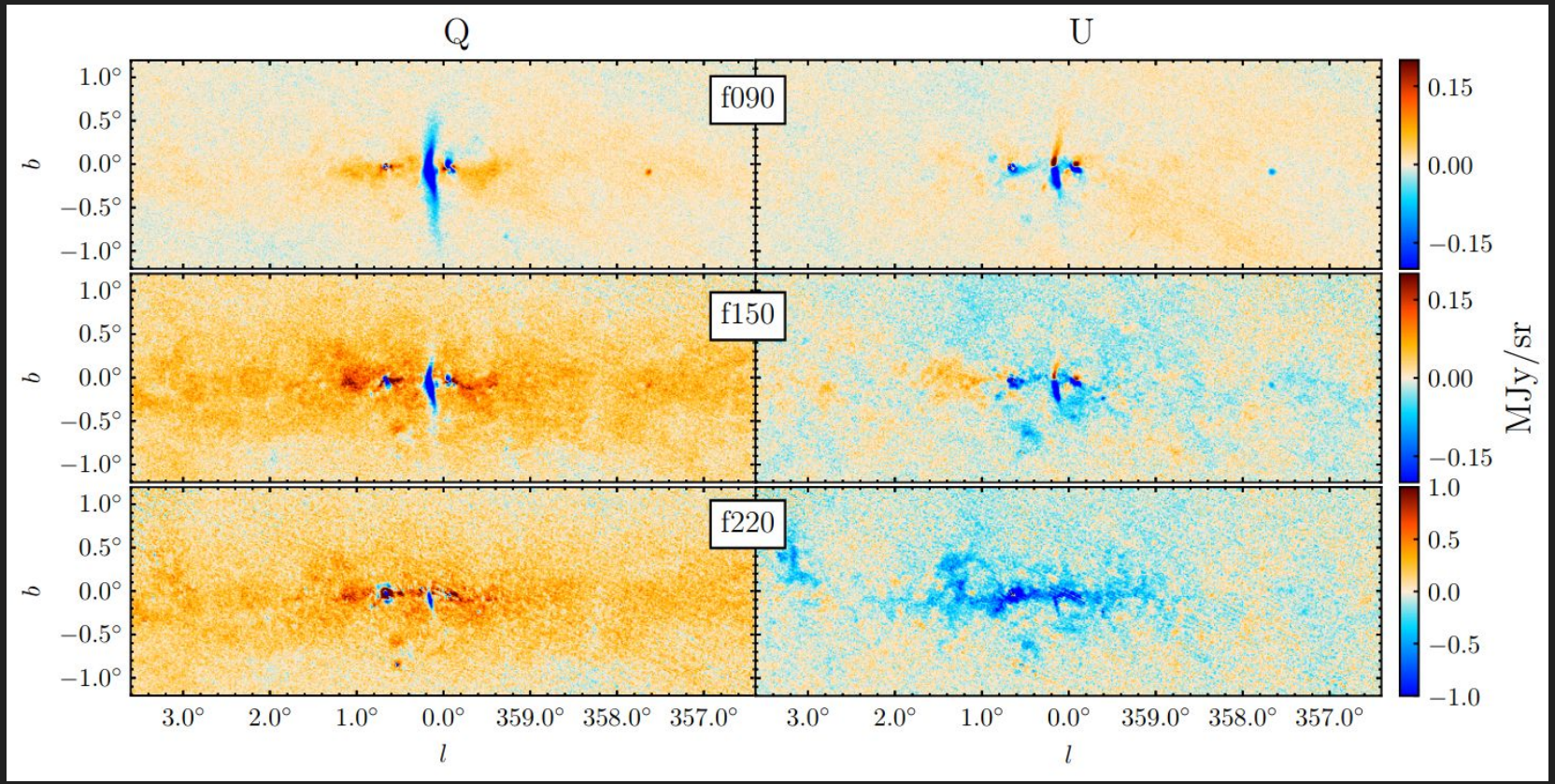
- Extended the ACT observational field to include a **~ 100 deg^2** field around Galactic center since 2019
- Total observation hours in 2019
  - f090: ~ 23 hours
  - f150: ~ 35 hours
  - f220: ~ 12 hours

Aiola et al. 2020

Mapmaking: ACT+Planck Co-adds

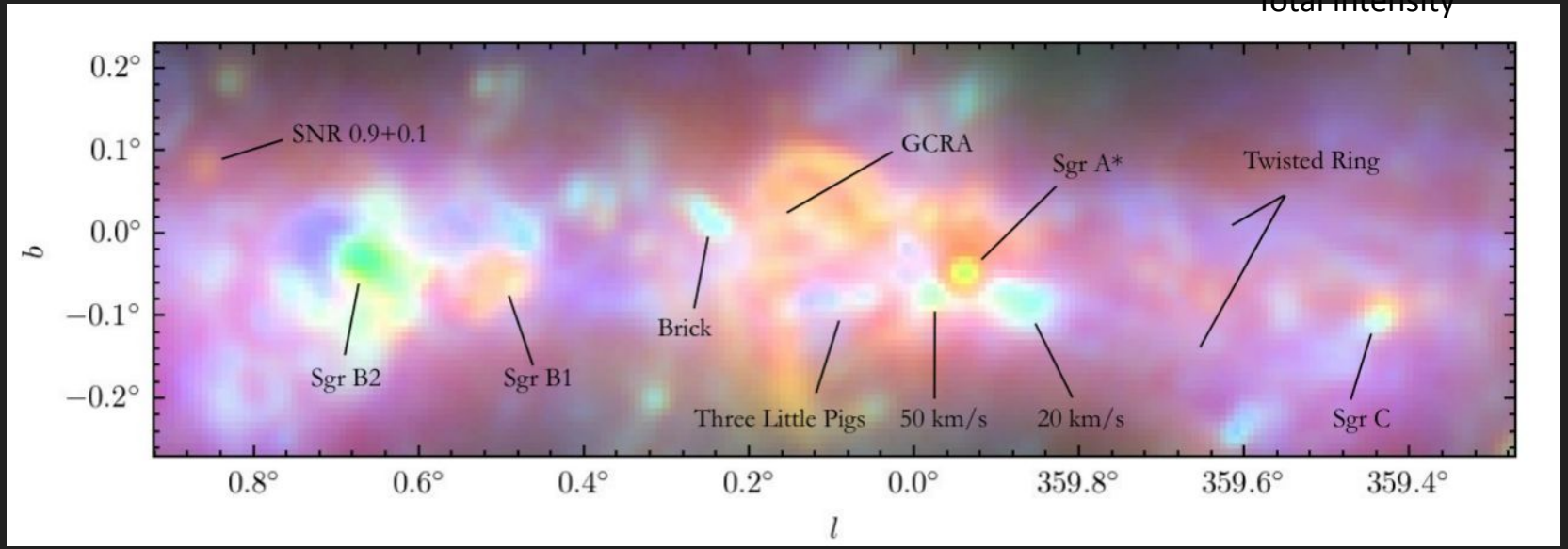


Maps: polarized intensity



ACT View of Galactic Center

- Red = f090, expected to highlight synchrotron and Planck CO
- Green = f150, mostly dust, some synchrotron and free-free
- Blue = f220, dust dominated



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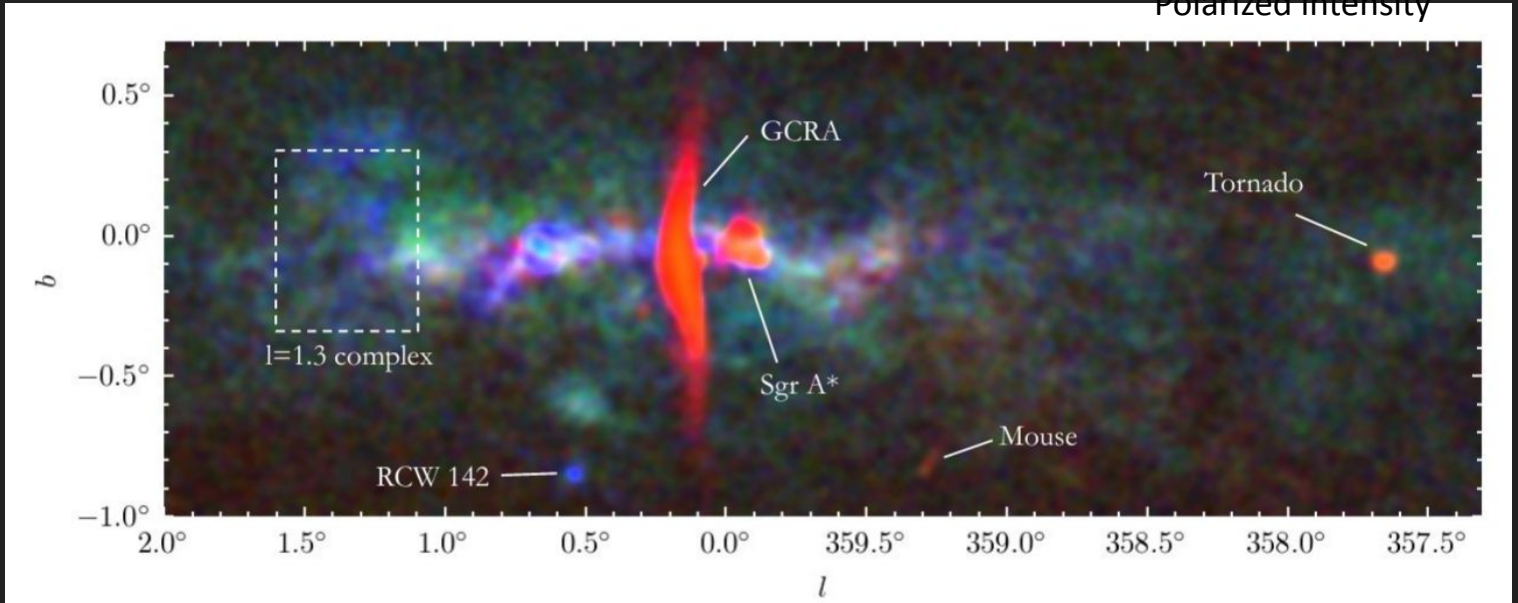
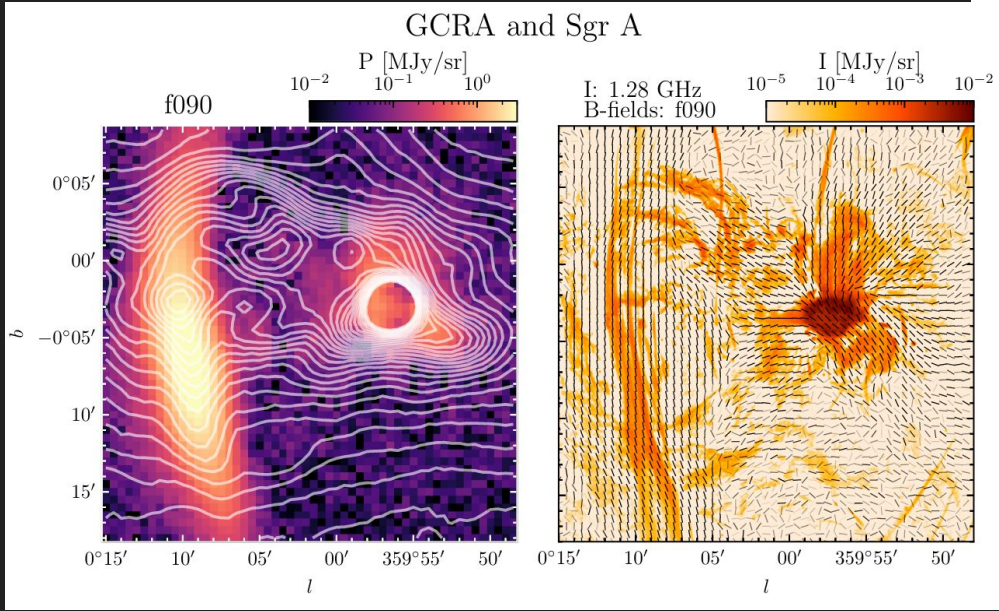
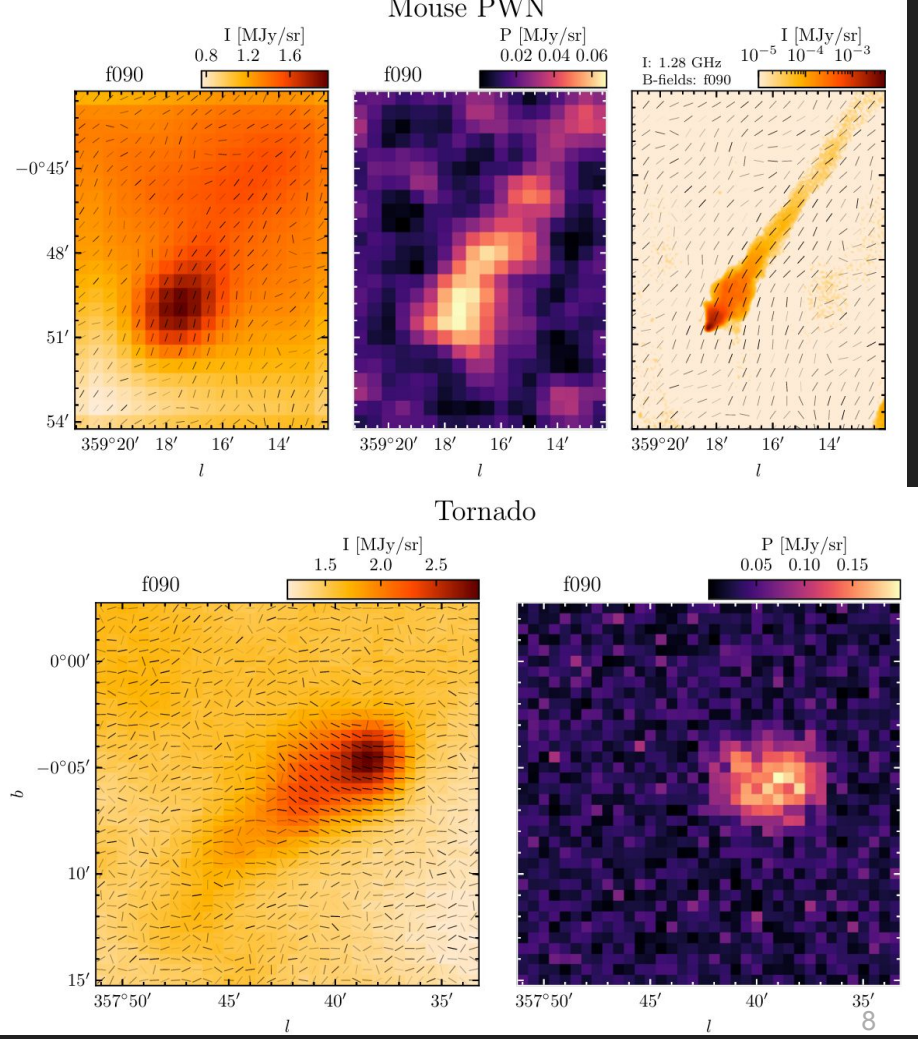


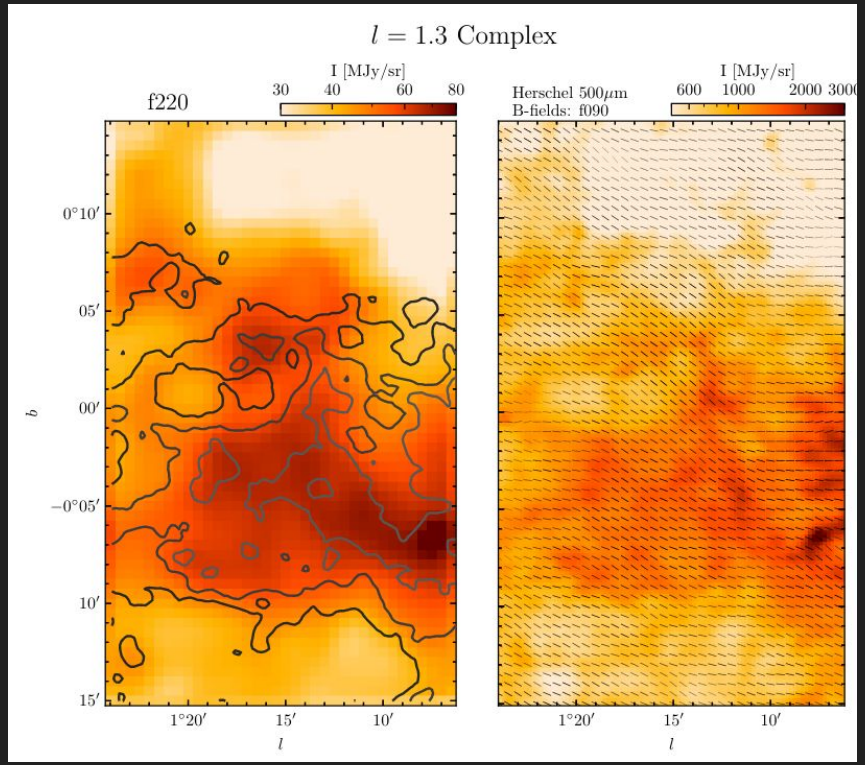
Radio Sources

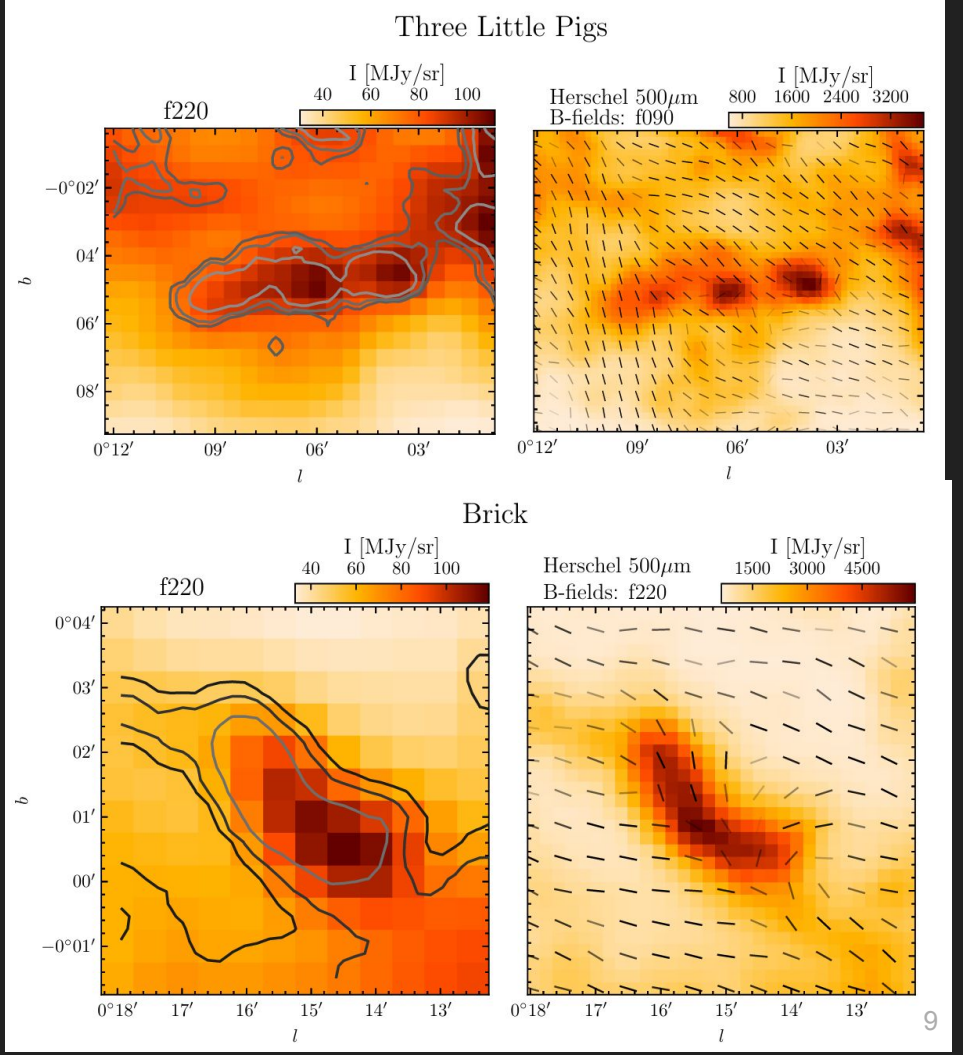




Molecular Clouds

- Study magnetic field morphology in both dense and diffuse molecular clouds





Thank you!