



The story of 11 CSS-NLS1s from a VLBA perspective

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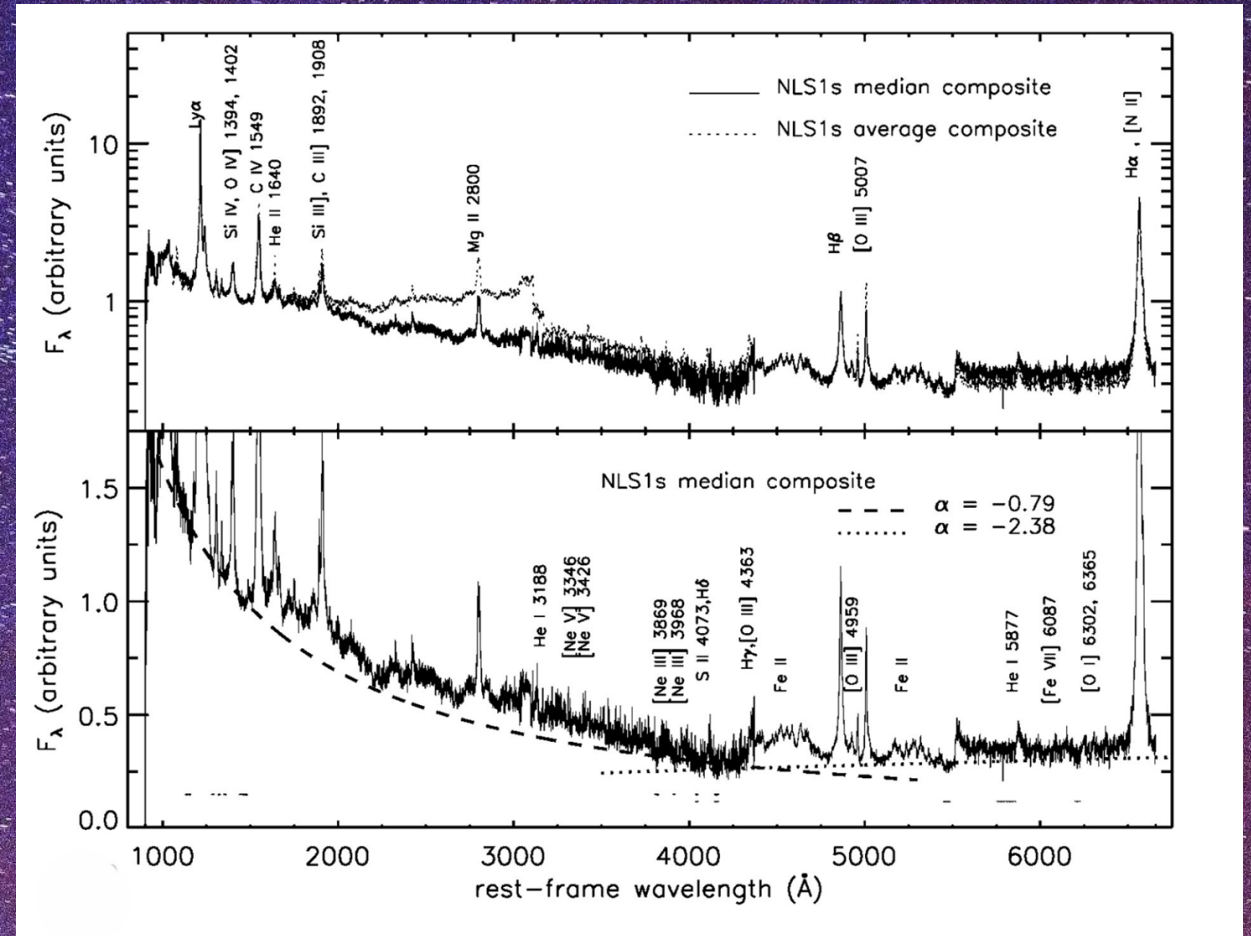
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Narrow-line Seyfert 1 (NLS1) galaxies

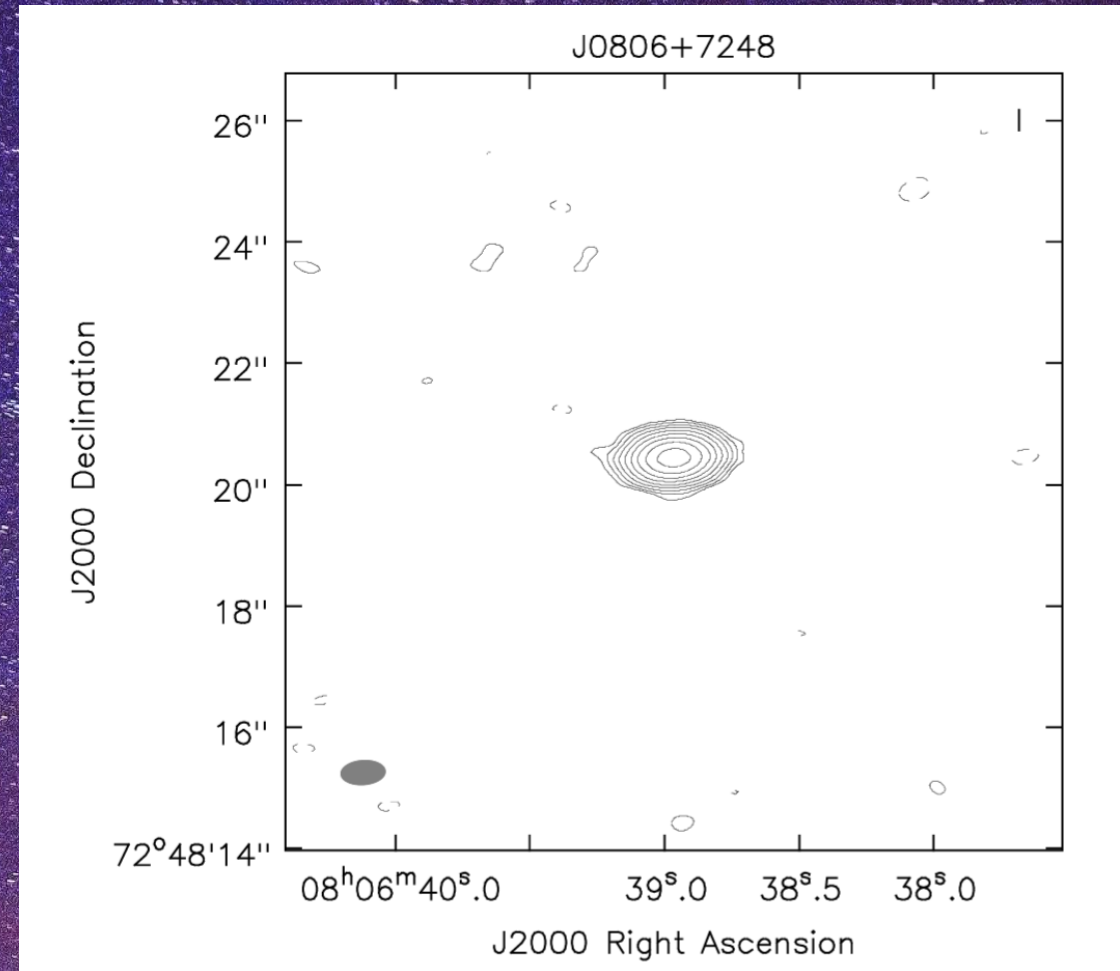
- Class of active galactic nuclei (AGN)
- Identification criteria based on spectral lines:
 - FWHM of broad $H\beta < 2000 \text{ km s}^{-1}$
 - Weak $[O III]$ in comparison to $H\beta$
 - $(S[O III]/S(H\beta) < 3)$
 - Low to intermediate mass supermassive black holes
 - Generally disk-like hosts
 - Can have relativistic jets



Constantin & Shields (2023)

Background

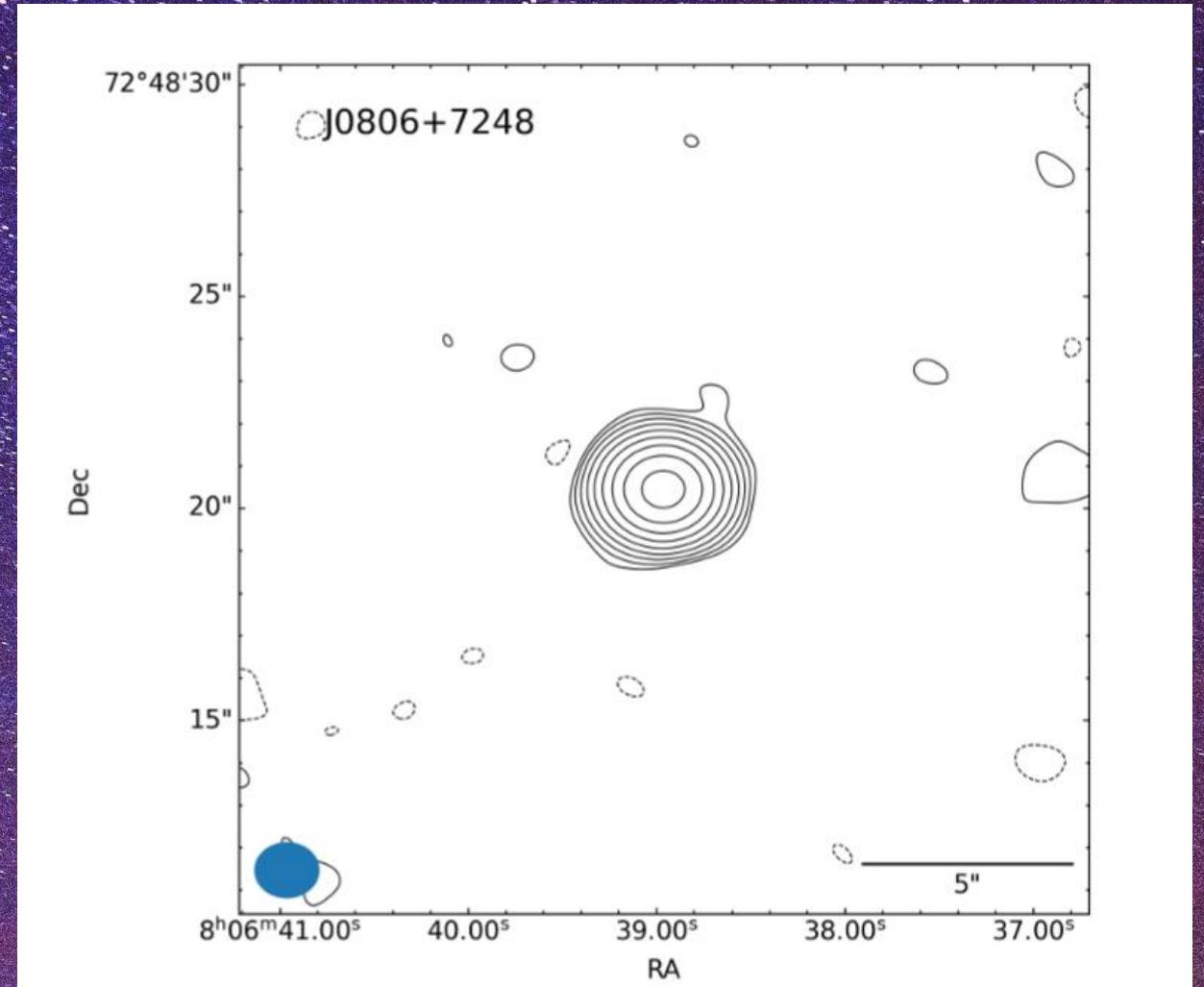
- 11 sources identified as compact steep-spectrum (CSS) sources with JVLA-A data in Berton+2018, Järvelä+2022, or Gupta et al. In prep
- $\nu L_\nu > 10^{40} \frac{\text{erg}}{\text{s}}$ at 5GHz
- $\alpha < -0.7$ when using ($S_\nu \propto \nu^\alpha$)
- VLBA 5 GHz observations from Nov 2014-Aug 2025
- Aim: Determine if these sources could be part of the parent population of Doppler-boosted, beamed gamma-NLS1s



JVLA-A 5 GHz map of J0806+7248 from Berton et al. 2018

Data processing, analysis etc.

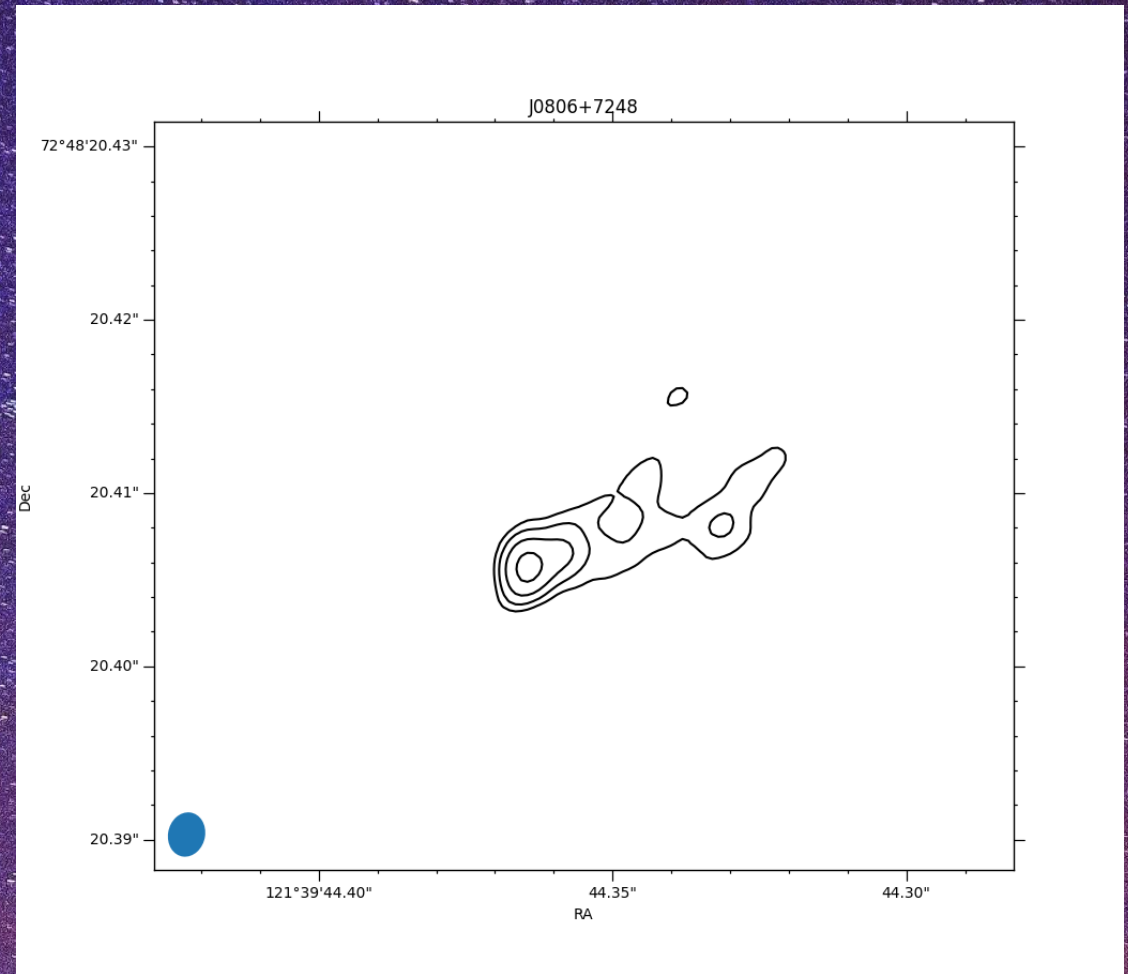
- Data reduction performed with VIPCALs
- Data analysis etc performed with CASA
- Determined e.g., flux density results, radio luminosities, and brightness temperatures
- Compared results to the JVLA-A 5 GHz results of B+18 and J+22



JVLA-A 5 GHz map of J0806+7248 from
Järvelä et al. 2022

Main results

- Jet-like structure visible in four sources
- VLBA flux density results are all lower than JVLA-A results
- Radio luminosity results are quite high for both the VLBA results and the out-resolved radio emission
- Star formation cannot be the only source of the radio emission
- Together with the selection criteria, the results strongly imply that these sources could be deboosted counterparts to highly boosted NLS1s.



VLBA 5 GHz map of J0806+7248
Varglund et al. submitted

Next steps

- Obtain intermediate-scale data to study the out-resolved radio emission with, e.g., e-MERLIN
- Study the host galaxies of CSS-NLS1s
- Large sample studies

