Optimal Imaging of Newborn AGN

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ABSTRACT

We image nineteen active galactic nuclei (AGNs) to test the imaging capabilities of the Sparse Modeling Imaging Library for Interferometry (SMILI) and observe the interactions of AGN jets with the presumed dense and clumpy surrounding interstellar medium (ISM). We confirm most of the observed AGN have structure consistent with that expected of young AGN. Our resulting images also show significant improvements compared to CLEAN algorithm reconstructions.

NEWBORN AGN

An AGN is the region at the extremely luminous center of a massive galaxy where a supermassive black hole emits powerful jets of magnetized plasma caused by the viscous dissipation of gravitational energy within the encompassing accretion disk. The sources selected for observation are extremely powerful, heavily obscured objects thought to be transitioning from starbursts to AGNs.

RESULTS: SMILI v. CLEAN — CONTINUED

Observations with e-MERLIN & VLBA

The enhanced Multi Element Remotely Linked Interferometer Network (e-MERLIN) is an interferometer array of telescopes in the UK with a maximum baseline of 217 km. The very long baseline array (VLBA) is a network of telescopes in the USA, with a maximum baseline of 8,611 km — making it capable of much higher resolution than e-MERLIN. We use data collectively obtained by e-MERLIN and VLBA at 1.4 GHz and 5 GHz.

REFERENCES