A VLBI STUDY OF GHZ-PEAKED-SPECTRUM RADIO SOURCES

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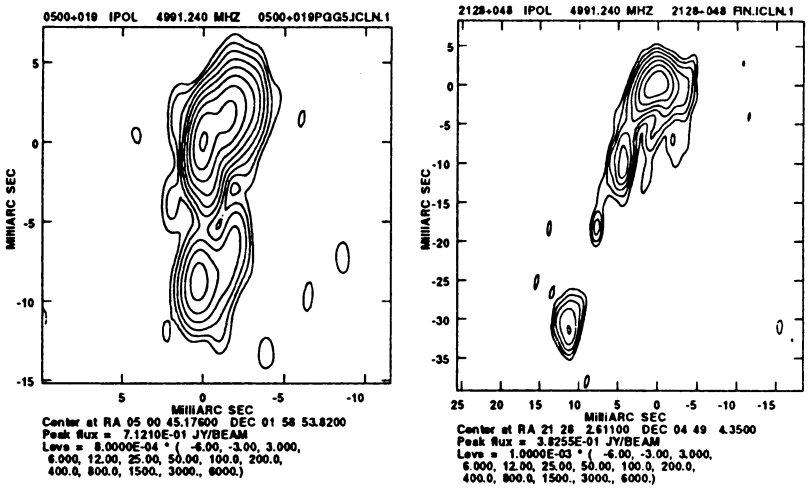
1. Introduction

The GHz-Peaked-Spectrum (GPS) radio sources are powerful ($L_{radio} \approx 10^{45}$ erg sec^{-1}) and compact (10 – 100 mas, 10 – 1000 parsecs) sources characterized by a simple convex spectrum which peaks near 1 GHz (O'Dea et al. 1991 and references therein).

Optical and radio observations lead to the conclusion that GPS sources are formed when the radio source is confined to the narrow line region (or an even smaller scale) by a dense and clumpy medium. This could lead to 2 different evolutionary scenarios: as first suggested by Phillips and Mutel (1982) GPS radio sources could be classical double radio sources at the very first stage of their life, or alternatively they will never become as large as the classical doubles since the dense and turbulent environment is able to confine and trap the radio emitting region on the scale of the NLR (Baum et al. 1990).

Early VLBI observations revealed that GPS quasars had asymmetric or complex radio morphologies and GPS galaxies had compact double (CD) or triple sources. Deeper and more sensitive VLBI observations of CSS (a similar class with moderately larger sizes) and GPS radio sources show that double structures are common also in quasars, accounting for (in this morphological classification) around half of the observed quasars, while complex morphologies are often seen also among GPS or CSS radio galaxies (Dalla-

R. Ekers et al. (eds.), Extragalactic Radio Sources, 67–68.



casa et al. 1995, Fanti et al. 1995, Stanghellini et al. in prep.) . Most of the GPS radio sources studied so far show low variability and no superluminal motion suggesting that in general these objects are not strongly Doppler boosted.

2. Observations and First Results

We observed 10 GPS radio sources in February 1993 at 4.992 GHz using the global VLBI network with the MK II recording system.

These GPS radio sources show a variety of morphologies and have angular sizes ranging from a few to a hundred mas corresponding to linear sizes from a few to hundreds parsecs.

Two objects (0500+019, 2128+048, see figures) might be classified as Compact Symmetric Objects (CSO) (Readhead et al 1994). Two others (2210+016, 1345+125) may belong to the CSO class but need further observations. The other objects are marginally resolved or show complex morphologies.

References

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Readhead A. C. S., et al. 1994, CERS meeting

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