Radio spectra of High Frequency Peakers
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High Frequency Peakers

Or extreme GPS.....

definition based on their radio spectrum

Ideally very young sources, but should/could be
- *very* rare
- *very* small
- “unsettled”
  -> variable?

Prototype: RXJ1459+3337

(Edge + 1996; Orienti & Dallacasa 2008)
High Frequency Peakers

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High Frequency Peakers

**Samples:**  Bright (Dallacasa & Stanghellini 2000; Guerra+ 2002)
               Weak (Stanghellini, Dallacasa, Orienti 2009)
               AT2OG (Hancock + 2010)
- **selection** based on the (non-simultaneous) spectrum + point-like on the arcsecond scale

**Properties:**
- **variability** (contamination from non young radio sources)
  Progressive depletion of samples as more observations are made.....
- **unpolarized**
  Boring data reduction, pol cal difficult to accomodate in short obs slots
- **milliarcsecond scale size**, structure to be observed in the optically thin regime
  Small number of resolution elements across the source, --> boring structure
  for most of them, but with a few exceptions
\[ V = \frac{1}{m} \sum_{i=1}^{m} \frac{(S_i - S)^2}{\sigma_i^2} \]

Classification: \( H, V, F \) (Orienti + 2010)
High Frequency Peakers

Progress (?) report on

“(J)VLA observations of about 35 faint HFPs”
(regardless their earlier sub-classification as V,F, H)

+ Spectacular spectral coverage: 1-25 GHz (1-45 GHz)
  16 IFs per frequency band

- Very short time on source (typically 50 sec)

**L band**: 2-3 IFs completely flagged out (RFI). A few with some residual RFI

**S band**: 2 IFs completely flagged out (RFI)
- H -

![Graphs showing flux density vs. frequency for various sources.](image-url)
J1613+4223
s 20.01r
z = (0.17)
X axis: Log (frequency)
X axis: Log (wavelength)
J1613+4223
s20.01r
z=(0.17)
High Frequency Peakers

“(J)VLA observations of about 35 faint HFPS”

Summary
Facts and speculations

Most of the spectra are peaked (one flat)
F sources are likely to be blazar-like objects
V sources can be generally considered HFP
H sources are less variable than V and their spectra are “more peaked”

Optically thick spectral indices are between -2.5 and -0.5
Optically thin spectral indices are rather steep
    typical of “old electron populations”/inactive objects
Spectra with continuous curvature

Discontinuous activity on short timescales, averaged up in older objects