

Technical Page

Proposal Type: Regular
 General Category: Astronomy
 Sub-Category: Continuum
 Observation Category: Extragalactic
 Total Time Requested: 96 Hours

Proposal Title: Quasi-Simultaneous Continuum Spectra of the Steepest-Spectrum Compact Radio Sources

ABSTRACT:

We propose to observe a sample of 20 compact radio sources with extremely steep spectra. They are from a statistically useful sample of the steepest-spectrum radio sources in the sky. This sample was constructed using large scale radio surveys, and contains objects with spectral index $1.5 \leq \alpha \leq 3.2$ (where $S_\nu \propto \nu^{-\alpha}$). Of these, we wish to observe the 20 most interesting sources in the Arecibo declination range. We will measure broadband spectra using each receiver (from 430MHz to 5GHz) in order to more accurately determine the spectral index, search for structure in the spectrum such as curvature or breakpoints, and quantify long-term variability. In addition, we will take data with the Arecibo Observatory Fourier Transform Machine (AOFTM) at 430MHz and with the new pulsar correlator at 1.4GHz along with the continuum observations. These data would not only allow us to search for pulsations from the sources (some of which may be pulsars) but to measure diffractive interstellar scintillation, and thereby place constraints on source size.

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Instrument Setup

430 G 610 L-wide S-band receiver C

Atmospheric Optical Instruments:

Special Equipment or setup: We will use 200 MHz filters at C-band (if available). We will use the S-wide receiver (if available).

RFI Considerations

Frequency Ranges Planned

425-435
 609-614
 1200-1250
 1400-1450

1650-1700
1900-1950 (if S-wide is available)
2350-2400
2800-2850 (if S-wide is available)
4000-4050
5000-5050
5900-5950

This proposal requires coordination with Punta Salinas radar within the band 1222-1381 MHz..

This proposal requires coordination with AFTWF within the band 425-435 MHz.