



Observing Application

Date : Apr, 05 2010
 Proposal ID : VLA/10A-257
 Legacy ID : AM1040
 PI : Joshua Marvil
 Type : Rapid Response -
 Exploratory Time
 Category : Extragalactic
 Total Time : 10.0

A sensitive, multi-frequency continuum study of M82 and NGC2146

Abstract:

We ask for 10 hours with the EVLA in D-configuration to observe M82 and NGC 2146 at one Ka-band frequency pair (28 and 30 GHz) and three K-band frequency pairs (18.5 and 19.75, 21 and 22.5, 24 and 25.5 GHz), using the full WIDAR bandwidths available with ECSO. We want to combine these observations with C-array data taken with the same correlator setup (AM1032). We have included 2x30 minute tracks to improve the flux density calibration by using equal-elevation scans at all frequencies proposed here, and additionally at 41 GHz (for AM1038). We will produce matched-resolution continuum images to be combined with images at other frequencies and analyzed for J. Marvil's thesis. We will create high-resolution spectra to investigate the astrophysics on ~100 pc scales, and determine how different regions in the galaxy sum to form the spatially-integrated spectrum. This thesis will test the spectral predictions made by models of the Radio/Far-Infrared relation, cosmic ray propagation, spectral aging and free-free absorption, to a level of accuracy that has only just now become possible with the enhanced sensitivity and improved frequency coverage of the EVLA.

Authors:

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Related proposals:

AM1002, AM1013, AM1032, AM1038

Joint:

Not a Joint Proposal

Observing type(s):

Continuum

VLA Resources

Name	Conf.	Frontend & Backend	Setup
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Name	Conf.	Frontend & Backend	Setup
Ka-ECSO	D	Ka Band 0.9 cm 26500 - 40000 MHz WIDAR ECSO	Comments: We will observe at 28 and 30 GHz, simultaneously, using 1 GHz bandwidth centered at each target frequency. We will use a 3 second integration time, 16 sub-band pairs with 64 channels per sub-band pair, and 4 polarization products. Each sub-band will be 128 MHz wide, which means each channel will be 2 MHz wide.
K-ECSO	D	K Band 1.3 cm 18000 - 26500 MHz WIDAR ECSO	Comments: We will observe at a total of 6 frequencies, in pairs, using three different tunings. We will use 1 GHz of bandwidth centered at each target frequency (18.5, 19.75, 21, 22.5, 24, and 25.5 GHz). We will use a 3 second integration time, 16 sub-band pairs with 64 channels per sub-band pair, and 4 polarization products. Each sub-band will be 128 MHz wide, which means each channel will be 2 MHz wide.

Sources:

Name	Position		Velocity		Group
M 82	Coordinate System	Equatorial	Convention	Redshift	M82
	Equinox	J2000			
	Right Ascension	09:55:52.7 00:00:00	Ref. Frame	LSRK	
	Declination	+69:40:46 00:00:00	Redshift	0.000677	
NGC 2146	Coordinate System	Equatorial	Convention	Redshift	NGC2146
	Equinox	J2000			
	Right Ascension	06:18:37.7 00:00:00	Ref. Frame	LSRK	
	Declination	+78:21:25 00:00:00	Redshift	0.002979	

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
M82-Ka	2.00	1	0 day	04:00:00	16:00:00	35
NGC2146-Ka	2.00	1	0 day	00:00:00	12:00:00	35
M82-K	2.50	1	0 day	04:00:00	16:00:00	35
NGC2146-K	2.50	1	0 day	00:00:00	12:00:00	35
M82 Flux Cal	0.50	1	0 day	00:00:00	24:00:00	0
N2146 Flux Cal	0.50	1	0 day	00:00:00	24:00:00	0

Session Constraints:

Name	Constraints	Comments
M82-Ka		Sensitivity calculations are based on 24 antennas, 25% overhead, and robust weighting.