



Observing Application

Date : Mar, 22 2011
 Proposal ID : VLA/11A-258
 Legacy ID : AF507
 PI : Dale Frail
 Type : Director's Discretionary
 Time - Target of
 Opportunity
 Category : Energetic Transients and
 Pulsars
 Total Time : 8.0

PTF11agg: A Rare GRB without a Detected Gamma-Ray Burst?

Abstract:

The Palomar Transient Factory discovered a transient source PTF11agg, which rose to 18th mag and lasted only 3 hrs. There is no quiescent optical counterpart to deep limits ($g > 26$ mag). Follow-up EVLA and OVRO observations one month later reveal a ~ 0.5 mJy source, with a rising spectrum in the cm bands, and evidence of daily flux variations. These properties are difficult to reconcile with a galactic or nearby extragalactic origin. If this is a cosmological transient, we use general brightness temperature arguments to show that it is likely a relativistic phenomena. Support for this comes interpreting the radio variability and cm spectrum, which can be interpreted as scintillation from a compact, optically thick source. The absence of prompt gamma-ray emission suggest PTF11agg may be a long-sought "orphan afterglow" of a gamma-ray burst. We propose to monitor this source to test whether PTF11agg is a relativistic explosion.

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Related proposals:

10B-221

Joint:

Not a Joint Proposal

Observing type(s):

Continuum, Single Pointing(s)

VLA Resources

Name	Conf.	Frontend & Backend	Setup
Cwide	B	C Band 6 cm 4000-8000 MHz WIDAR ECSO	Comments: To achieve both maximum continuum sensitivity and maximum spectral range, we will observe in two 1 GHz bands centered in 4.86 GHz and 7.4 GHz. This approach has been used successfully to study other transients with the EVLA.
Kband	B	K Band 1.3 cm 18000 - 26500 MHz WIDAR ECSO	Comments: Maximum continuum sensitivity requires full continuous bandwidth.

Sources:

Name	Position		Velocity		Group
PTF11agg	Coordinate System	Equatorial	Convention	Radio	PTF
	Equinox	J2000			
	Right Ascension	08:22:17.2 00:00:00.0	Ref. Frame	LSRK	
	Declination	+21:37:38.0 00:00:00.0	Velocity	0.00	

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
ISS	3.00	1	0 day	06:00:00	10:00:00	0
Highend	1.00	1	0 day	06:00:00	10:00:00	0
Monitor	1.00	4	50 day	06:00:00	10:00:00	0

Session Constraints:

Name	Constraints	Comments
ISS	We would need this scheduled asap which the source is still bright.	
Highend	This SB would be submitted around the same time as the 3-hr ISS block to infer spectral slope.	
Monitor		

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
ISS	PTF11agg	Cwide	3.0 hour	0.005 mJy/bm	
Highend	PTF11agg	Kband	1.0 hour	0.020 mJy/bm	