



Observing Application

Date : Mar, 14 2013
 Proposal ID : VLBA/13A-504
 Legacy ID : BH194
 PI : Assaf Horesh
 Type : Director's Discretionary
 Time - Exploratory Time
 Category : Energetic Transients and
 Pulsars
 Total Time : 9.0

VLBA Observations of a Recent Tidal-Disruption-Event candidate

Abstract:

The recent discovery of the transient source Swift J1644+57 has unveiled an entirely new class of tidal disruption events (TDEs). Motivated by this discovery, we conducted a pilot systematic EVLA transient survey. One of the 11 transients which we found in our survey, RTC2158-00, resides close to the center of a red and dead galaxy at $z=0.3$ and exhibits a self-absorbed radio spectrum, similar to Swift J1644+77. Therefore, the current hypothesis is that RTC2158-00 is a TDE. A recent EVLA observation shows that the radio spectrum of RTC2158-00 is now evolving and is consistent with an expanding source. However, there is still a possibility that this event is related to AGN activity. In order to test our hypothesis, we propose a VLBA observation. If the source is a TDE, we expect that the VLBA high precision astrometry will show that it is positioned in the center of the host galaxy. In this case, the VLBA observation will also help constrain the source size and the expansion velocity. If the source is associated with and AGN-like activity, we expect that the VLBA high resolution image will reveal a double compact radio source.

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Related proposals:

Joint:

Not a Joint Proposal

Observing type(s):

Continuum

VLBA Resources

Resource Name: X band

| Details | Stations | Observing Parameters | Correlation Parameters | Special Features |
|---|--|---|--|--|
| Wavelength: 3.6 cm Processor: Socorro-DiFX Observing Mode: Standard | VLBA <input checked="" type="checkbox"/> Br <input checked="" type="checkbox"/> Fd <input checked="" type="checkbox"/> Hn <input checked="" type="checkbox"/> Kp <input checked="" type="checkbox"/> La <input checked="" type="checkbox"/> Mk <input checked="" type="checkbox"/> NI <input checked="" type="checkbox"/> Ov <input checked="" type="checkbox"/> Pt <input checked="" type="checkbox"/> Sc <input checked="" type="checkbox"/> <hr/> HSA <input type="checkbox"/> Ar <input type="checkbox"/> Ef <input type="checkbox"/> GBT <input type="checkbox"/> VLA-Y27 <input type="checkbox"/> <hr/> VLA-Y1 <input type="checkbox"/> <hr/> Geodetic | Observing System: PFB System Bandwidth: 32 MHz Baseband Channels: 16 Polarization: Dual Agg. Bit Rate (Mbits/sec): 2048 | Correlator Passes: 1 Integration Period (sec): 2.0 Spectral Points /BBC: 64 No of Fields: 1 | Full Polarization <input checked="" type="checkbox"/> Pulsar Gate <input type="checkbox"/> Convert to Mark4 <input type="checkbox"/> |

Resource Name: K-band

| Details | Stations | Observing Parameters | Correlation Parameters | Special Features |
|---|--|---|--|--|
| Wavelength: 1.3 cm Processor: Socorro-DiFX Observing Mode: Standard | VLBA <input checked="" type="checkbox"/> Br <input checked="" type="checkbox"/> Fd <input checked="" type="checkbox"/> Hn <input checked="" type="checkbox"/> Kp <input checked="" type="checkbox"/> La <input checked="" type="checkbox"/> Mk <input checked="" type="checkbox"/> NI <input checked="" type="checkbox"/> Ov <input checked="" type="checkbox"/> Pt <input checked="" type="checkbox"/> Sc <input checked="" type="checkbox"/> <hr/> HSA <input type="checkbox"/> Ar <input type="checkbox"/> Ef <input type="checkbox"/> GBT <input type="checkbox"/> VLA-Y27 <input type="checkbox"/> <hr/> VLA-Y1 <input type="checkbox"/> <hr/> Geodetic | Observing System: PFB System Bandwidth: 32 MHz Baseband Channels: 16 Polarization: Dual Agg. Bit Rate (Mbits/sec): 2048 | Correlator Passes: 1 Integration Period (sec): 2.0 Spectral Points /BBC: 64 No of Fields: 1 | Full Polarization <input checked="" type="checkbox"/> Pulsar Gate <input type="checkbox"/> Convert to Mark4 <input type="checkbox"/> |

Sources:

| Name | Position | | Velocity | | Group |
|------------|-------------------|----------------------------|------------|-------|---------------|
| RTC2158-00 | Coordinate System | Equatorial | Convention | Radio | TDE Candidate |
| | Equinox | J2000 | | | |
| | Right Ascension | 21:58:44.403 00:00:00.0 | Ref. Frame | LSRK | |
| | Declination | -00:24:43.79 00:00:00.0 | | | |
| | Calibrator | No | Velocity | 0.00 | |

Sessions:

| Name | Session Time (hours) | Repeat | Separation | GST minimum | GST maximum | Elevation Minimum |
|--------|----------------------|--------|------------|-------------|-------------|-------------------|
| X_band | 4.00 | 1 | 0 day | 19:00:00 | 01:00:00 | 0 |
| K_band | 5.00 | 1 | 0 day | 19:00:00 | 01:00:00 | 0 |

Session Constraints:

| Name | Constraints | Comments |
|------|-------------|----------|
| | | |

Session Source/Resource Pairs:

| Session Name | Source | Resource | Time | Figure of Merit |
|--------------|--------|----------|------|-----------------|
| | | | | |