



Observing Application

Date : Feb, 02 2012
 Proposal ID : VLBA/12A-449
 Legacy ID : BE61
 PI : Andreas Eckart
 Type : Director's Discretionary
 Time - Target of
 Opportunity
 Category : Active Galactic Nuclei
 Total Time : 32.0

Coordinated observations of SgrA*: Triggering 43 GHz phase referencing

Abstract:

Based scheduled VLT, SUBARU near-infrared and APEX sub-mm time in parallel to NuStar and the May/July 2012 a 3 Ms Chandra observing run we request triggered observations of SgrA* at 43GHz. Combining ~600 minute polarized near-infrared light curves with sub-mm observations we propose to study the accretion physics of SgrA*, probe if NIR flares are followed by sub-mm flares or dips observed with APEX, test for proposed variability models, and to improve the derivation of the spin and inclination of the SMBH. In the SgrA* MHD model by Yuan+2009 the expelled gas reaches a velocity of 0.8c above the accretion disk shortly after the begin of the flare. If that component stays at up to about 20% of the typical sources brightness over a typical NIR (and mm-wave) flare length of 100 minutes our 7mm VLBI phase referencing experiment will detect a positional shift of the order of a few tenths of a milli-arcsecond. These experiments have never been done before or during flares! Hence the NIR polarization based modeling and the 7mm-VLBI experiment have the potential to discriminate between outflow and disk flare models.

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Related proposals:

Joint:

Not a Joint Proposal

Observing type(s):

Continuum

VLBA Resources

Name	Details	Stations	Observing Parameters	Correlation Parameters
7mm	Wavelength: 7 mm Processor: Socorro-DiFX Observing: Standard	VLBA <input checked="" type="checkbox"/> Br <input checked="" type="checkbox"/> Fd <input checked="" type="checkbox"/> Hn <input type="checkbox"/> Kp <input checked="" type="checkbox"/> La <input checked="" type="checkbox"/> Mk <input type="checkbox"/> NI <input checked="" type="checkbox"/> Ov <input checked="" type="checkbox"/> Pt <input checked="" type="checkbox"/> Sc <input type="checkbox"/> <hr/> HSA Ar <input type="checkbox"/> Ef <input type="checkbox"/> GBT VLA-Y27 <hr/> VLA-Y1 <hr/> Geodetic	Bandwidth: 16 MHz Baseband Channels: 8 Sample Rate (Msamples/s): 32 Bits/Sample: 2 Polarization: Dual Agg. Bit Rate (Mbits/sec): 512	Full Polarization Pulsar Gate Correlator Passes: 1 Integration Period (sec): 2.0 Spectral Points /BBC: 8 No of Fields: 0

Sources:

Name	Position		Velocity		Group
sgra*	Coordinate System	Equatorial	Convention	Radio	SgrA* and calibrators
	Equinox	J2000			
	Right Ascension	17:45:40.03 00:00:00.0	Ref. Frame	LSRK	
	Declination	-29:00:28.0 00:00:00.0	Velocity	0.00	
J1745-283	Coordinate System	Equatorial	Convention	Radio	SgrA* and calibrators
	Equinox	J2000			
	Right Ascension	17:45:52.4968 00:00:00.0	Ref. Frame	LSRK	
	Declination	-28:02:26.294 00:00:00.0	Velocity	0.00	
J1748-291	Coordinate System	Equatorial	Convention	Radio	SgrA* and calibrators
	Equinox	J2000			
	Right Ascension	17:48:45.6860 00:00:00.0	Ref. Frame	LSRK	
	Declination	-29:07:39.404 00:00:00.0	Velocity	0.00	
nrao530	Coordinate System	Equatorial	Convention	Optical	SgrA* and calibrators
	Equinox	J2000			
	Right Ascension	17:33:02.70 00:00:00.0	Ref. Frame	Barycentric	
	Declination	-13:04:49.5 00:00:00.0	Redshift	0.90200	

Sessions:

Name	Session Time (hours)	Repeat	Separation	GST minimum	GST maximum	Elevation Minimum
I	8.00	4	0 day	20:30:00	04:30:00	0

Session Constraints:

Name	Constraints	Comments
I	triggered by NIR flare as seen by observer at the VLT. Triggering procedure will be worked out in close collaboration with NRAO staff.	The actual integration time will be substantially less than 4x8 hours since we expect to trigger only once or twice resulting in about 5+2=7 hours of observing time. So the actual observing time is closer to 10 hours. Here we only give the interval over which we will trigger.