



Observing Application

Date : May, 07 2009
 Proposal ID : VLA/09A-198
 Legacy ID : AE174
 PI : Stewart Eyres
 Type : Rapid Response -
 Exploratory Time
 Category : Stellar
 Total Time : 4.0

V458 Vul - a classical nova for the first time

Abstract:

Classical novae are interacting binaries in which a white dwarf (WD) accretes matter from its companion, ultimately leading to an optical outburst due to a thermonuclear runaway (TNR) at the base of the accreted layer. This recurs every few thousand years, but the first TNR on the series is important as later ones are affected by contamination by nucleosynthesis products of previous TNR and entrainment of the WD material. V458 Vul is a nova detected in 2007 and found to have a 14,000 year old planetary nebula - the remnant of a common envelope phase and indicative that it is undergoing its first TNR. Thus we have a unique opportunity to examine the progress of the first TNR. While VLA imaging in 2007 did not detect the PN, subsequent H α imaging shows the PN reacting to the CN outburst via photo-ionisation. The observations proposed here will make use of the VLA in B and C array, to provide resolution-matched L band and C band images enabling determination of emission mechanisms, mapping of local extinction (and hence dust) and removal of stellar contamination, which is significant.

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Related proposals:

Joint:

Not a Joint Proposal

Observing type(s):

Continuum

VLA Resources

Name	Conf.	Frontend & Backend	Setup
LBandB	B	L Band 20 cm 1000 - 2000 MHz VLA Correlator - Single Channel Continuum	Rest frequencies: 1464.9,1385.1 MHz Bandwidth: 50 MHz
CBandC	C	C Band 6 cm 4000-8000 MHz VLA Correlator - Single Channel Continuum	Rest frequencies: 4885.1,4835.1 MHz Bandwidth: 50 MHz
LBandC	C	L Band 20 cm 1000 - 2000 MHz VLA Correlator - Single Channel Continuum	Rest frequencies: 1464.9,1385.1 MHz Bandwidth: 50 MHz

Sources:

Name	RA / RA Range	Dec / Dec Range	Epoch	Velocity / z	Group
V458Vul	19:54:24.0 00:00:00.0	+20:52:47 00:00:00	J2000	Velocity : 0.00	V458 Vul

Sessions:

Name	Session Time (hours)	Repeat	Separation	LST minimum	LST maximum	Elevation Minimum
LBand initial	1.00	1	0 day	00:00:00	24:00:00	0
CBand initial	1.00	1	0 day	00:00:00	24:00:00	0
CBand followup	1.00	1	0 day	00:00:00	24:00:00	0
LBand followup	1.00	1	0 day	00:00:00	24:00:00	0

Session Constraints:

Name	Constraints	Comments

Session Source/Resource Pairs:

Session Name	Source	Resource	Time	Figure of Merit	Subarray
LBand initial	V458Vul	LBandB	1.0 hour	0.025 mJy/bm	
CBand initial	V458Vul	CBandC	1.0 hour	0.024 mJy/bm	
CBand followup	V458Vul	CBandC	1.0 hour	0.024 mJy/bm	
LBand followup	V458Vul	LBandC	1.0 hour	0.025 mJy/bm	

Present for observation: no

Staff support: None

Plan of Dissertation: no

