



14364 - PSR J2124-3358: A Unique, Isolated MSP/PWN/Bowshock

Cycle: 23, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) PSRJ2124-3358	WFC3/UVIS	2	21-Oct-2015 21:30:53.0	yes

2 Total Orbits Used

ABSTRACT

The nearby single millisecond pulsar J2124-3358 shows a unique Halpha bow shock around a swept-back, asymmetric X-ray trail. Our ACIS exposure measures fine structure near the pulsar, discerning the spin/polar jet axis from the equatorial torus. Spectra measure the PSR cap heating and PWN synchrotron cooling. A search for moving knots in the PWN can constrain the post-shock flow speed. Comparison with our ground optical imaging and spectroscopy measures the 3-D shock geometry and is enhanced by an HST Halpha image resolving the sub-arcsecond shock apex. These permit accurate modeling of the pulsar wind momentum distribution, a measurement of the pulsar moment of inertia and a novel test of the recycling+evaporation scenario for isolated millisecond pulsars.

OBSERVING DESCRIPTION

Proposal 14364 (STScI Edit Number: 0, Created: Wednesday, October 21, 2015 8:30:54 PM EST) - Overview

WFC3/UVIS exposures of a faint pulsar bow shock. 2600s F656N + 100s+F606W for each of two orbits. We will place the critical nebula apex near the read-out node and may post-flash for improved CTE.

Proposal 14364 - Visit 01 - PSR J2124-3358: A Unique, Isolated MSP/PWN/Bowshock

Thu Oct 22 01:30:54 GMT 2015

Visit	Proposal 14364, Visit 01, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/UVIS Special Requirements: ORIENT 5D TO 30 D									
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous			
		(1)	PSRJ2124-3358	RA: 21 24 43.8535 (321.1827229d) Dec: -33 58 44.67 (-33.97908d) Equinox: J2000	Proper Motion RA: -14.12 mas/yr Proper Motion Dec: -50.34 mas/yr Parallax: 0.0031" Epoch of Position: 2000	V=26+/-2	Reference Frame: ICRS			
	<i>Comments: Diffuse Halpa nebula</i> <i>Extended=YES</i>									
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	(1) PSRJ2124-3358	(1) PSRJ2124-3358	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N	FLASH=8	POS TARG 70,70		2600 Secs (2569 Secs) [=>2569.0 Secs]	[1]
	2	(1) PSRJ2124-3358	(1) PSRJ2124-3358	WFC3/UVIS, ACCUM, UVIS-CENTER	F606W	FLASH=6	POS TARG 70,70		200 Secs (170 Secs) [=>170.0 Secs]	[1]
	3	(1) PSRJ2124-3358	(1) PSRJ2124-3358	WFC3/UVIS, ACCUM, UVIS-CENTER	F656N	FLASH=8	POS TARG 70.099,7 0.106		2600 Secs (2640 Secs) [=>2640.0 Secs]	[2]
	4	(1) PSRJ2124-3358	(1) PSRJ2124-3358	WFC3/UVIS, ACCUM, UVIS-CENTER	F606W	FLASH=6	POS TARG 70.099,7 0.106		200 Secs (211 Secs) [=>211.0 Secs]	[2]

