

Proposal for *Chandra* Observations

Cycle 10

Cover Page

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Proposal Title Quantitative X-ray Spectral Modeling of the Canonical O Supergiant Wind-Shock Source zeta Puppis			
Subject Category STARS AND WD			
Proposal Type GO	Linked Proposal N	Distr. Medium WWW ONLY	Proprietary Rights S
Total Requested Time 210.00	Number of Targets 1		Proposed Budget

Joint Proposal?	
HST Orbits	HST Instruments:
XMM Time	RXTE Time:
NOAO Nights?	NOAO Telescope/Instruments:
NRAO Hours	NRAO Telescopes

Abstract		
<p>The X-ray bright O supergiant zeta Puppis has a 68 ks archival HETGS spectrum that is rich with spectrally resolved diagnostic emission lines. The 210 ks observation we are proposing here will enable us, primarily by the quantitative modeling of the broad and asymmetric emission lines, to determine the properties of the shock-heated wind and to determine the relative roles of mass-loss rate reduction and large scale clumping and porosity. Not only will the proposed observation generate a spectrum that will be one of the most significant legacies of the Chandra gratings, but it will provide key information about the mass-loss rates of O stars, which will have a bearing on studies of the galactic ISM and the fates of evolved massive stars.</p>		
Proposal Number	Date: 2008-03-20	Admin. use only

General Form

PI Prof. David H Cohen		
Proposal Title Quantitative X-ray Spectral Modeling of the Canonical O Supergiant Wind-Shock Source zeta Puppis		
Co-Investigator(s)		
First Name Last Name	E-Mail Institute	Country
Maurice Leutenegger	maurice@milkyway.gsfc.nasa.gov NASA/GSFC	USA
Janos Zsargo	jzsargo@bruno.phyast.pitt.edu UNIVERSITY OF PITTSBURGH	USA
John Hillier	jdh@rosella.phyast.pitt.edu UNIVERSITY OF PITTSBURGH	USA
Stan Owocki	owocki@bartol.udel.edu UNIVERSITY OF DELAWARE	USA
Are there additional Co-Is listed in the science justification? <input type="checkbox"/> N		
Is the first Co-I doing observing, rather than the PI? <input type="checkbox"/> N Telephone:		

Institute Endorsement

Name of Administrator Constance Hungerford
Administrative Authority Provost
Administrative Institute Swarthmore College
Admin Signature: _____ Date: _____
PI Signature: _____ Date: _____

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Target Summary

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Tar No	Target Name	(J2000)	Offsets		Optical Monitor V-Mag	Observ. Time (ksec)	Detector	(c/s) Count Rate	Time- Constr?	Grid	
	Solar System Object		Y Detector	Z Detector			Grating				1st Order
	Grid Name		R.A.	SIM Trans			HRC				Total Fld.
	Target Description (keywords)		Dec.				Timing				Ext.Src?
#Points	MaxDist.										
1	zeta Pup NONE MASSIVE STARS; WINDS/OUTFLOWS/MASS-LOSS	08 03 35.0 -40 00 11.3			N	210.000	ACIS-S HETG N	0.200000 0.300000 10.000000	N N	N N	

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ACIS Parameters (Required, Pileup, Telemetry Parameters)

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Tar No.	Exposure Mode	CCDs On						Most Eff.	Subarray		Alternating Exposures		Energy Filter		Spectra	
	Telemetry. Format	I0	I1	I2	I3			StartRow	Nbr. Rows	Y/N	Exp.Time	Lower Thresh.	Max Count	Mult. Lines		
		S0	S1	S2	S3	S4	S5	CCD Time	Type	No.Rows		Y/N	Range			
1	TE F		N	N	N	N		Y	NONE			N				
		Y	Y	Y	Y	Y	Y									

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ACIS Parameters (Custom:Telemetry Overflow Parameters)

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Tar No	Or-der	Chip	Type	Spatial Windows							Sample Rate	Additional Spatial Windows
				Start Row	Start Col	Width	Height	Lower Threshold	Energy Range			

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Target Constraints

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Tar No	Window Constraint			Roll Constraints			Phase Dependent Observations			
	Flag	Start Time	Stop Time	Flag 180?	Angle (degrees)	Tolerance (degrees)	Flag	Epoch(MJD) Period(days)	Min.Phase Min.Error	Max.Phase Max.Error

Tar No	Monitoring Observations				Group Observations			Un-interrupt?	Coordinated		Add. Constraints
	Flag No.	Geometric Factor	Interval (days)	Tolerance (%)	Flag	Group ID	Interval (days)		Flag	Interval (days)	

TOO Details

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Tar No	Trig-ger?	Alternates		Response Window			Prob-ability	Initial Alloc.	Followup Observations				Obs.Params specified by Target No.
		Group Name	Nbr. Req.	Type (days)	Start	Stop			Order	Time	Interval (days)	Tolerance (%)	
									1				
									2				
									3				
									4				
									5				
									6				
									7				
									8				

TOO Trigger Criteria

TOO Followup Instructions

If this TOO is a resubmission of a proposal approved in the previous Cycle, should this TOO be canceled if the previous Cycle TOO is triggered?

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Target Remarks

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Tar No	Remarks Coordinated Observation: Observatories