

THE X-RAY UNIVERSE 2011

27 - 30 June 2011
Berlin, Germany

A conference organised by the
XMM-Newton Science Operations Centre,
European Space Astronomy Centre (ESAC), European Space Agency (ESA)

ABSTRACT BOOK

Oral Communications and Posters

Edited by

Andy Pollock

with the help of

Matthias Ehle, Cristina Hernandez, Jan-Uwe Ness,
Norbert Schartel and Martin Stuhlinger

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Rotationally modulated X-ray emission from the accretion shock in CTTSCostanza Argiroffi¹¹*Dip. di Fisica, Univ. di Palermo**V2129 Oph Collaboration**V4046 Sgr Collaboration*

To study the accretion shocks of classical T Tauri stars (CTTS) we obtained high-resolution X-ray spectra of two CTTS, V2129 Oph and V4046 Sgr, to look for phase-resolved X-ray signatures of shock-heated plasma.

The 200 ks Chandra/HETGS observation of V2129 Oph (a 1.35 M_{sun} star, rotating in 6.5 d) covered 0.5 stellar rotation. The 360 ks XMM/RGS observation of V4046 Sgr (a binary system, with two 0.9 M_{sun} components, synchronously rotating in 2.42 d) monitored 2.2 system rotations. The stellar photosphere, magnetic field, and accretion geometry of both stars were constrained by quasi-simultaneous optical monitoring (photometry, spectroscopy, and spectropolarimetry).

The cool plasma component of V2129 Oph varies, with high density plasma and high EM observed during the first observing segment, and lower density and lower EM observed during the second. The emission lines, produced by the high density cool plasma of V4046 Sgr, display periodic flux variations with a period of half the system rotational period.

Our results confirm that the dense cool plasma in CTTS is material heated in the accretion shock, and that the observed X-ray variability can be explained in terms different viewing angles at different rotational phases of the accretion-shock region.

X-ray emission from protostellar jet HH 154: first evidence of a diamond shock?Rosaria Bonito¹, Salvatore Orlando¹, Marco Miceli^{2,1}, Giovanni Peres^{2,1}, Giusi Micela¹, Fabio Favata³¹*INAF-Osservatorio Astronomico di Palermo, Italy*²*Dipartimento di Fisica, Università di Palermo, Italy*³*European Space Agency, 8-10 rue Mario Nikis, 75015 Paris, France*

In the last decade X-ray emission from about ten protostellar jets has been discovered and now it appears as a common feature of the most energetic jets. We present the X-ray observations of the protostellar jet HH 154 (observed with both XMM/Newton and Chandra) over a time base of about 10 years showing the presence of a stationary shock at the base of the jet. We interpret this result as the first evidence of a diamond shock originating from a nozzle through which the jet is launched into the unperturbed ambient medium. The origin of the nozzle could be related to the protostellar magnetic field which can be constrained by our model. Here we discuss the numerical model of the jet/nozzle system and compare the X-ray emission synthesized from our model with the X-ray observations.