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Spectroscopy of high mass X-ray binaries with *Swift/XRT*.

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Abstract

We present the X-ray spectroscopy study of three high mass X-ray binary systems, Vela X–1, Cen X–3 and V0332+53 using data obtained with *Swift/XRT*. The continuum emission of Vela X–1 is consistent with two absorbed power laws, each of them modified by different absorbing columns and with the same power law index. Moreover, the high energy part of the spectrum is modified by absorption components, like Gaussian profile, *smedge* or *edge* functions. We also detect emission lines and fit as Gaussians at $6.406^{+0.004}_{-0.021}$ keV (Fe Kα) and $2.44^{+0.04}_{-0.03}$ keV (S XV Heα). The continuum emission of Cen X–3 is consistent with two absorbed power laws, each of them modified by different absorbing columns and with the same power law index. We also detect emission lines and fit as Gaussians at $6.432^{+0.020}_{-0.023}$ keV (Fe Kα), $6.84^{+0.12}_{-0.10}$ keV (Fe XXVI), 2.90±0.18 keV Ar Kα and $1.12^{+0.07}_{-0.06}$ keV (Ne X Lyα). The presence of iron emission lines at 6.4 keV and 6.8 keV simultaneously indicates that there are at least two distinct emission sites. Fluorescence in a localized region of relatively low ionization may be responsible for the 6.4 keV emission. We could interpret the emission line at 6.8 keV as a blend of several narrow lines due to scattering of radiation from the neutron star in an extended highly ionized stellar wind. Finally, the continuum emission of V0332+53 is consistent with an absorbed power law and a Gaussian emission line to describe the soft excess at low energies. No emission lines are present in this system.

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