# Pulsed fraction spectra constrain properties of neutron-star High Mass X-ray binaries


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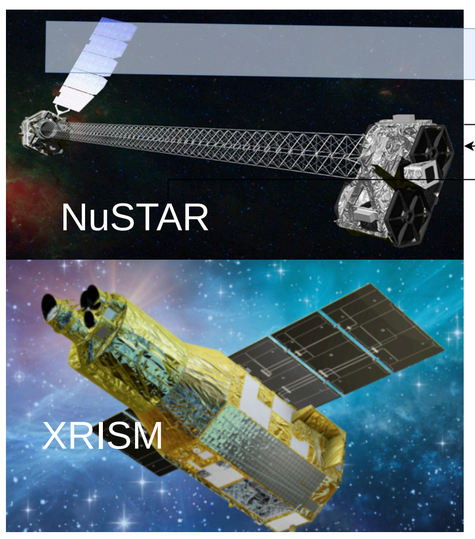
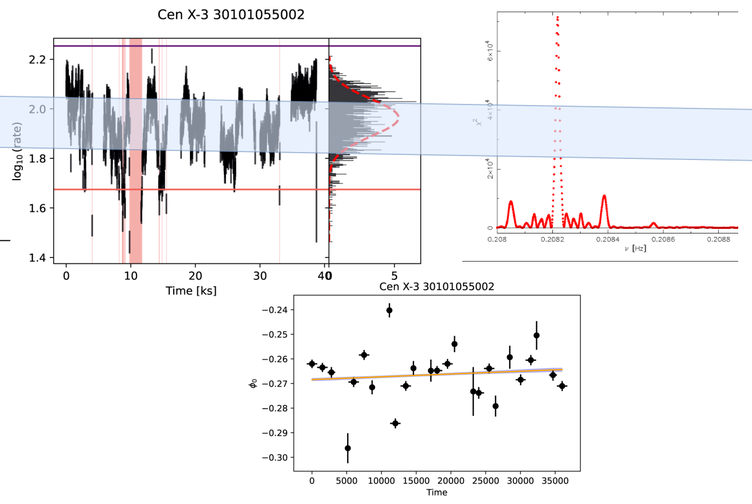
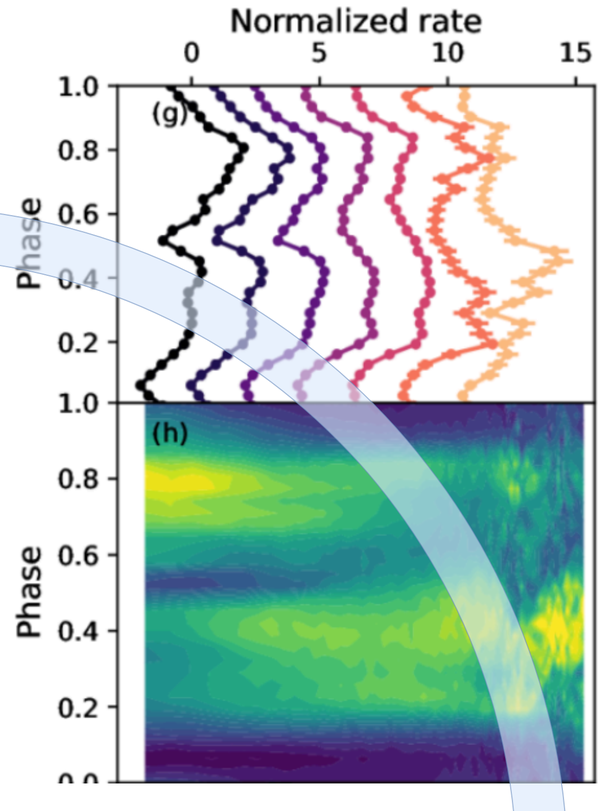
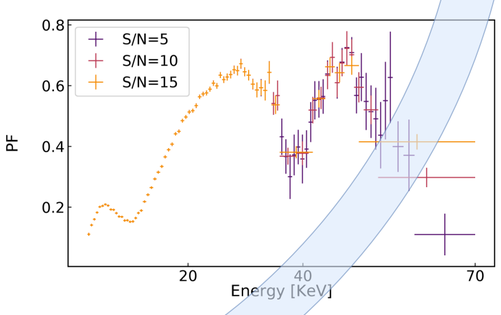
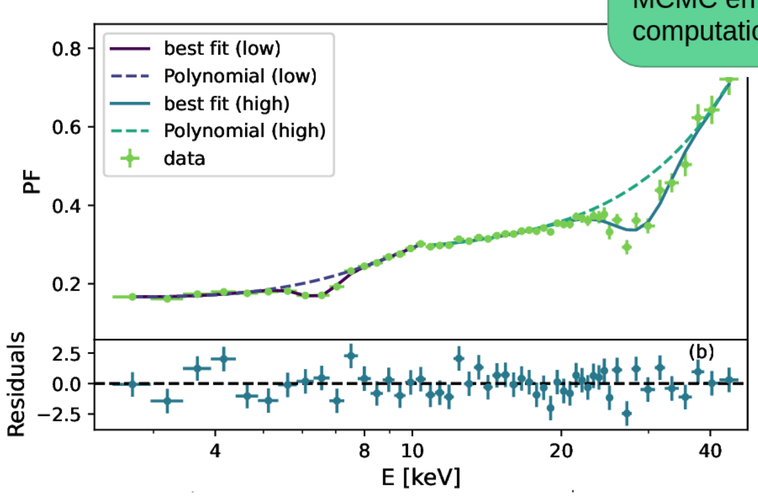


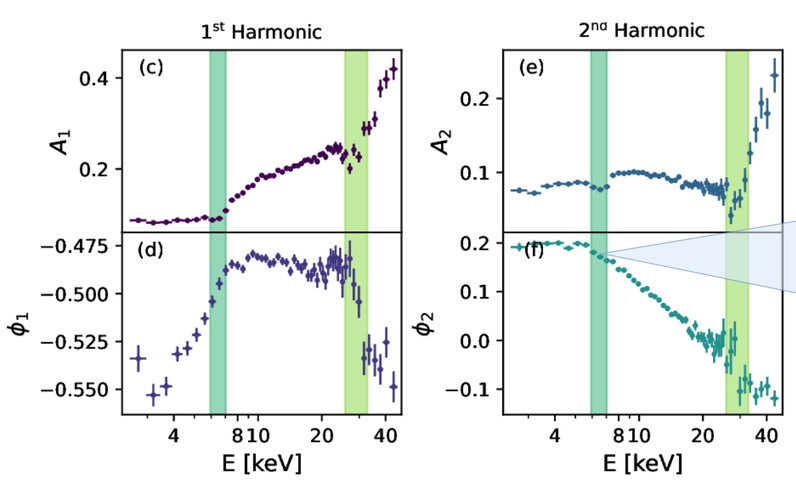



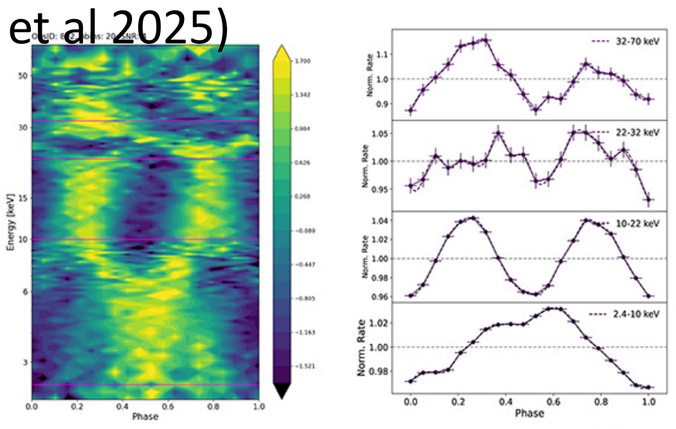

Data collection, cleaning and src/bkg extraction → Timing analysis and time (GTI) filters → Energy-phase Matrix computation (at the instrument energy resolution) → Rebinning at the optimal SNR → Calculate Fourier components, assess errors through MC simulations → Fitting of the PF spectrum: polynomial+Gaussian MCMC error computation

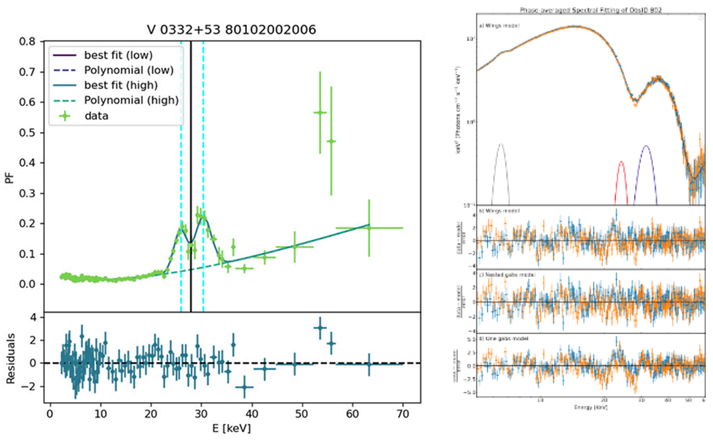


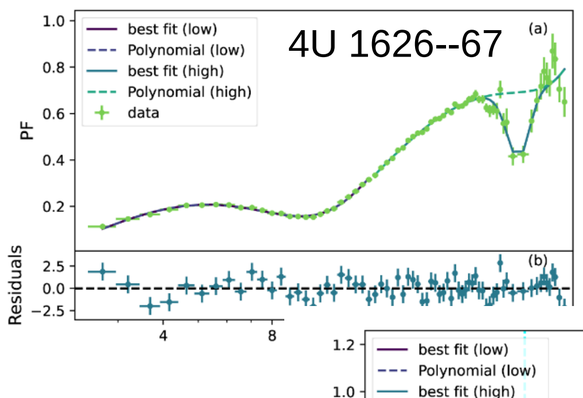



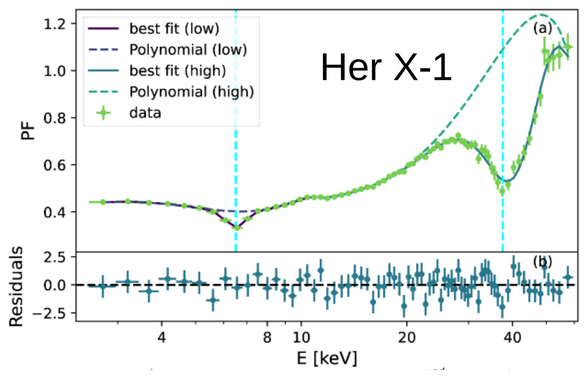

V0332+53: we find two bumps near the cyclotron energy that guide a spectral model and favor an ortogonal rotator (D'Aì et al 2025)



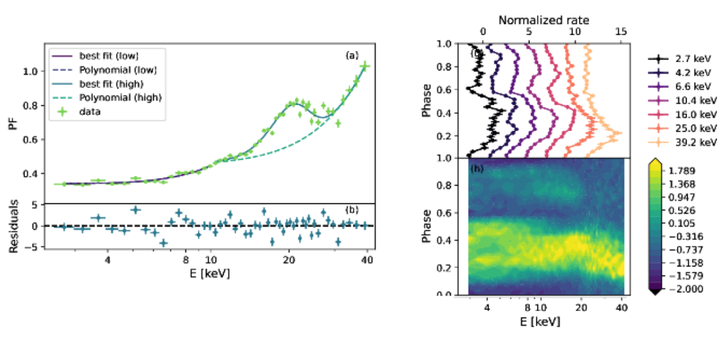




4U1626-67, Cen X-3, Her X-1, Cep X-4, 4U 1901+03 : pulsed fraction is reduced at the cyclotron energy. which is compatible with beam-pattern change in the emission.




4U 1538-522: we find enhanced pulsed fraction at the cyclotron energy, as the secondary peak dims, this limits the geometrical parameter space (Maniadakis et al. 2025).





**Papers:**
Ferrigno et al. (2023) https://doi.org/10.1051/0004-6361/202347062; D'Aì et al. (2025) https://doi.org/10.1051/0004-6361/202451469 ; Maniadakis et al. (2025, 2026) https://doi.org/10.1051/0004-6361/202555112 https://doi.org/10.1051/0004-6361/202659954; Ambrosi et al. (2026) https://doi.org/10.1051/0004-6361/202557808


Data used publicly available !
https://renkulab.io/projects/carlo.ferrigno/pp
light/sessions/new?autostart=1