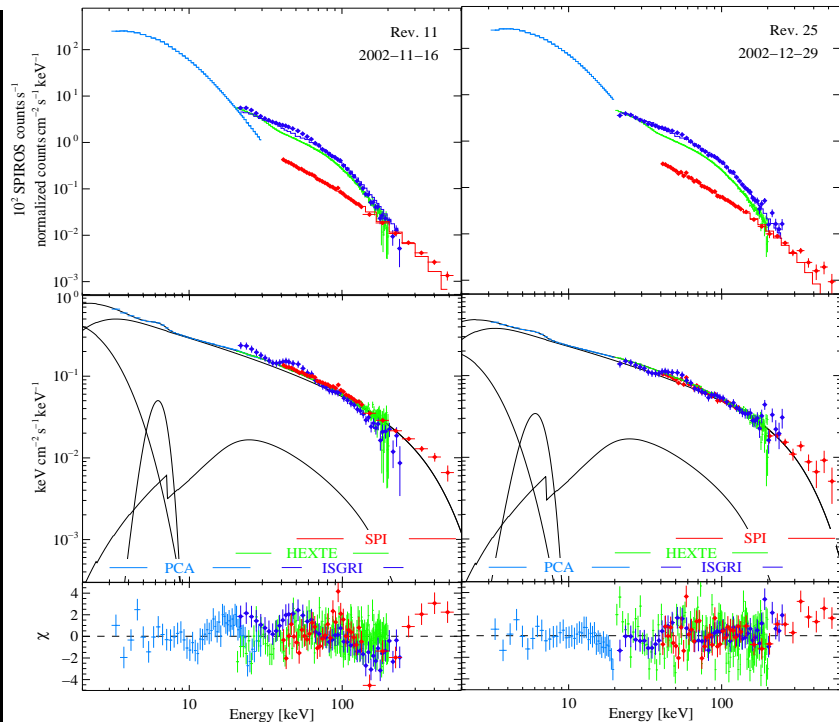




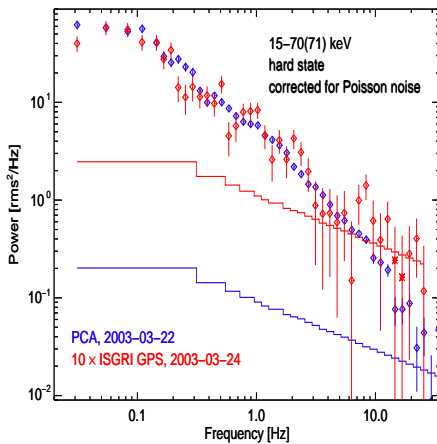
Cyg X-1, the prototype X-ray binary containing a stellar mass black hole, was observed for 1.3 months during *INTEGRAL*'s performance verification phase. We presented the first *INTEGRAL* broad band spectrum, as well as one of only a few multi-mission spectra in the early mission by organizing quasi-simultaneous *RXTE* observations. Parameters for several current Comptonization models were derived and refined with progressing calibration. We also presented the first power spectrum measured with *ISGRI*, again evaluated against contemporary *RXTE* data.

### Broad band energy spectra

During 2002 Nov. and Dec. the persistent black hole binary Cyg X-1 was found in its Comptonization dominated hard state. Summing the data by *INTEGRAL* orbit ( $\sim 3$  d) has proven to be a good choice to take spectral variability into account. Thermal Comptonization models like *compTT* or *eqpair* principally describe the data and give comparable results. We note residuals above 300 keV, where the non-thermal "hard tail" reported by *CGRO* should become visible. Typical physical parameters (2002 Nov. 16) are:  $\tau = 0.71^{+0.05}_{-0.07}$ ,  $kT = 82^{+16}_{-5}$  keV,  $\Omega/2\pi = 0.11^{+0.01}_{-0.01}$ ,  $\chi^2_{\text{red}} = 1.58$ , where  $\tau$  is the electron optical depth,  $kT$  is the electron temperature, and  $\Omega/2\pi$  is the reflection fraction. A further refined calibration will enable us to distinguish between current models.



*INTEGRAL/RXTE* energy spectra and best fits of Cygnus X-1. Model:  $\text{const} \times \text{phabs} \times [ \text{diskbb} + \text{gauss} + \text{compTT} + \text{reflect}(\text{compTT}) ]$ .



Noise corrected power spectra of Cygnus X-1. Lines: detection limit.

### High resolution timing

After subtraction of the Poisson noise level *RXTE* and *ISGRI* qualitatively measure the same 3-20 Hz source variability, i.e., the 15–70 keV power spectra show the same shape. Note, that the figure shows one of the few short Galactic Plane Scan observations of Cyg X-1 (analysis in collaboration with A.A. Zdziarski). The rms variability measured with *ISGRI* lies about an order of magnitude too low due to the high background. We are working on a correction and plan to analyse the less well studied power spectrum at energies  $>70$  keV (*INTEGRAL/XMM/RXTE* campaign in 2004 Nov.) .

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