

The relativistic Fe emission line in XTE J1650-500: indications for gravitational light-bending?

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XTE J1650-500 is a BHC X-ray transient that was in outburst between September 2001 and June 2002

We analysed 57 RXTE observations covering the first 30 days of the outburst (Sep.6-Oct 5)

The 2.5-160 keV energy spectra reveal the presence of a relativistic Fe K α emission line (Fig.1)

The Fe K α line is not linearly dependent on the power-law flux: the line depends weakly on it until Sep.19, then there is evidence of a positive correlation after Sep.19 (Fig.2)

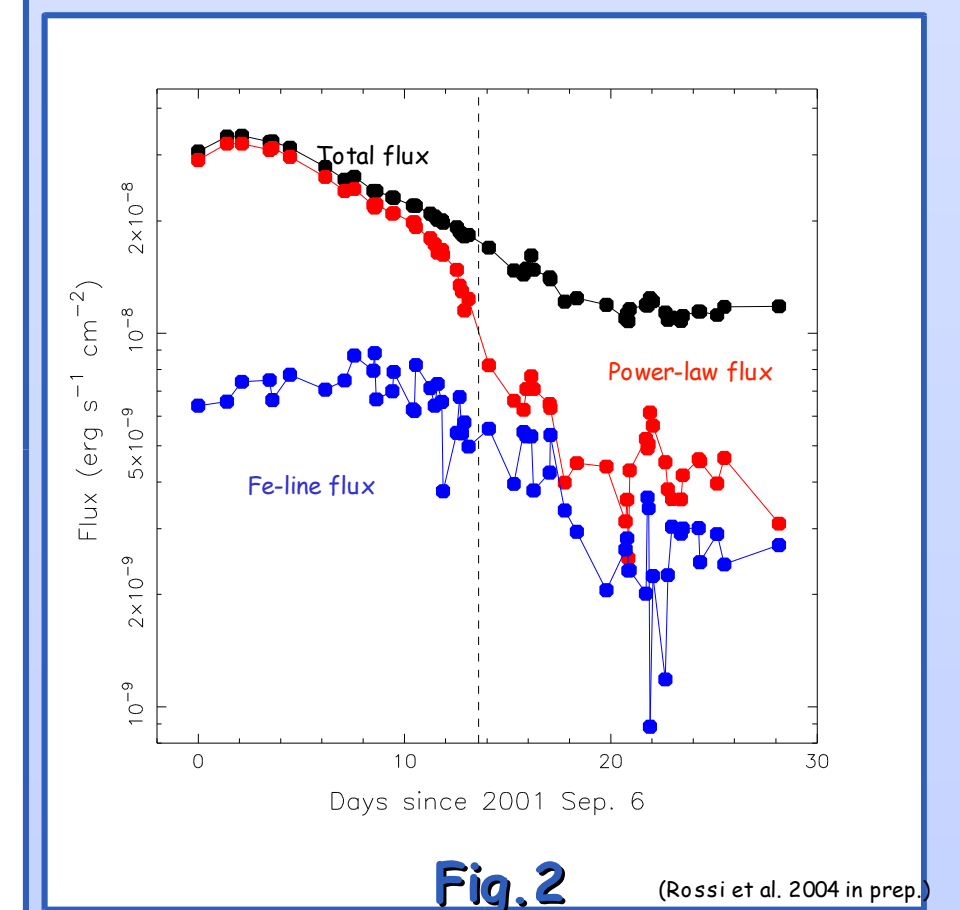
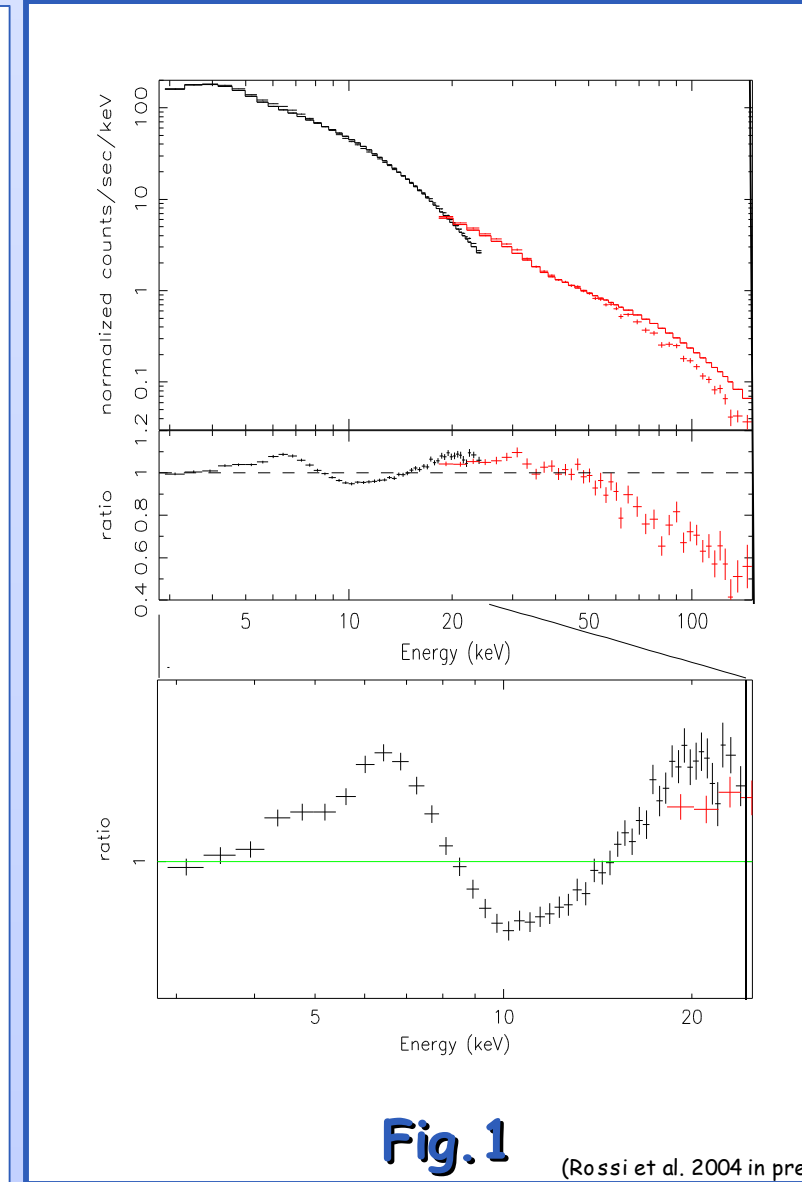


Fig.1 (Rossi et al. 2004 in prep.)

Fig.2 (Rossi et al. 2004 in prep.)

THE SPECTRAL VARIATIONS OF THE Fe K α LINE OBSERVED IN XTE J1650-500 (Fig.3a) ARE CONSISTENT WITH THE PREDICTIONS OF THE LIGHT BENDING MODEL PROPOSED BY MINIUTTI & FABIAN (2004) (Fig.3b)

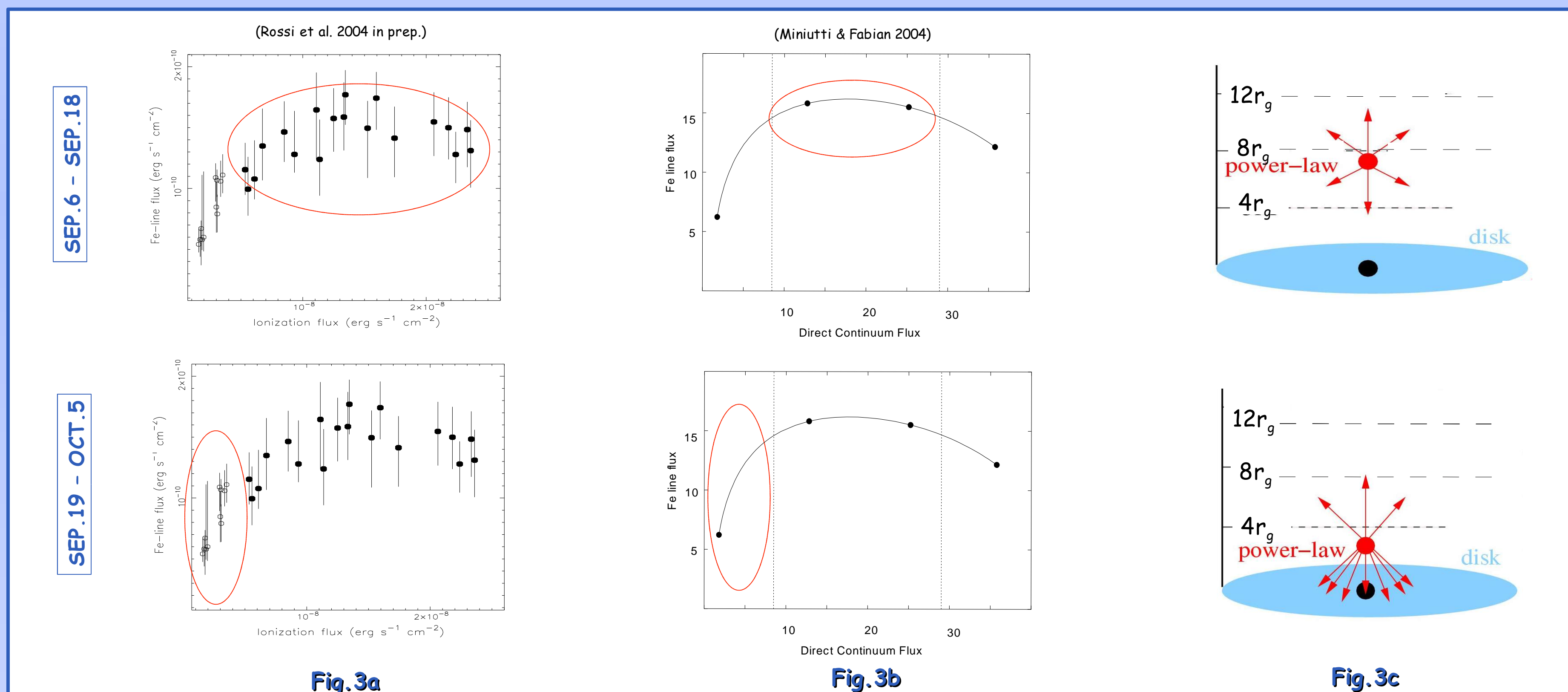


Fig.3a

Fig.3b

Fig.3c

In the framework of this model, the variability of the line can be explained by the motion above the accretion disk of a hard X-ray source located near the BH (Fig.3c): at the beginning, this source is at medium distance ($2-4 r_g < h_s < 7-13 r_g$), then it gradually approaches the disk reaching very short distances ($< 2-4 r_g$) after Sep.19

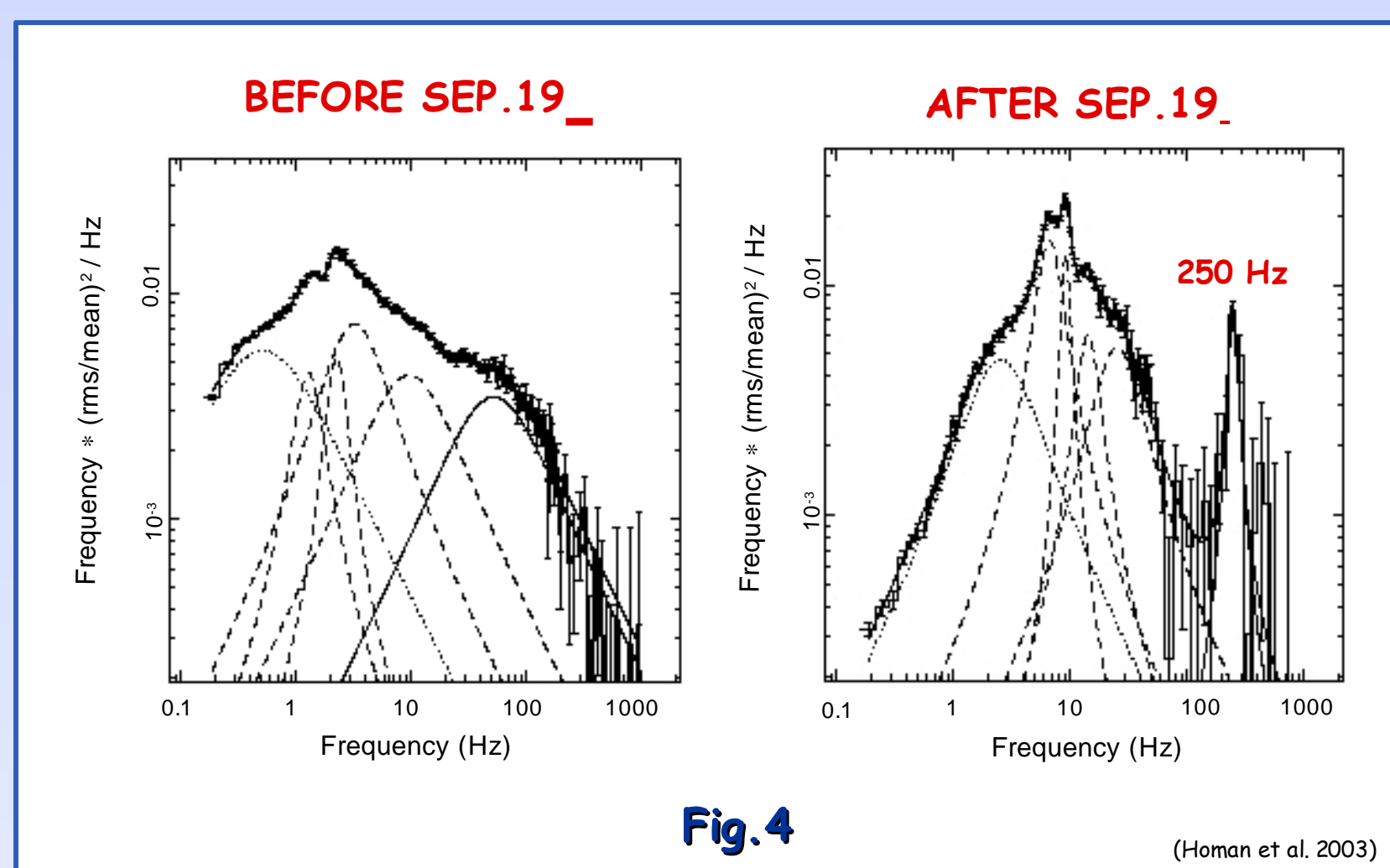


Fig.4

(Homan et al. 2003)

From the timing analysis of the same RXTE data set, we discovered a 250 Hz QPO (Homan et al. 2003). It is worth to note that this high-frequency QPO is first detected after Sep.19 (Fig.4)

IF THE HARD X-RAY SOURCE IS ASSOCIATED WITH A JET, XTE J1650-500 SUGGESTS A LINK BETWEEN Fe K α EMISSION LINES, QPOs AND JETS