

- **bmc: Comptonization by relativistic matter**

This is an analytic model describing Comptonization of soft photons by matter undergoing relativistic bulk-motion. The typical scenario involves thermal X-rays from the inner region of an accretion disk in a black-hole binary illuminating in-falling matter in close proximity to the black-hole event horizon. For a detailed description of the model, refer to Titarchuk, Mastichiadis & Kylafis 1997, ApJ, 487, 834; Titarchuk & Zannias, 1998, ApJ, 493, 863; Laurent & Titarchuk 1999, ApJ, 511, 289; Zannias, Borozdin, Revnivtsev., Trudolyubov, Shrader, & Titarchuk, 1999, ApJ, 517, 367; or Shrader & Titarchuk 1999, ApJ 521, L21. The model parameters are the characteristic black-body temperature of the soft photon source, a spectral (energy) index, and an illumination parameter characterizing the fractional illumination of the bulk-motion flow by the thermal photon source. It must be emphasized that this model is not an additive combination of power law and thermal sources, rather it represents a self-consistent convolution. The bulk-motion up-scattering and Compton recoil combine to produce the hard spectral tail, which combined with the thermal source results in the canonical high-soft-state spectrum of black hole accretion. The position of the sharp high energy cutoff (due to recoil) can be determined using the theta function $\theta(E_c - E)$. The model can also be used for the general Comptonization case when the energy range is limited from above by the plasma temperature (see compTT and compST).

par1	Temperature of thermal photon source in keV.
par2	Energy spectral index alpha.
par3	Log of the A parameter. Note that f in Borozdin <i>et al.</i> 1999 and Shrader & Titarchuk 1999 is 10^{par3}
norm	A_N defined in Borozdin et al 1999 and Shrader & Titarchuk (1999)