THE HARD X-RAY EMISSION OF SEYFERT GALAXIES: THE NUSTAR VIEW OF MCG +8-11-11 AND NGC 6814

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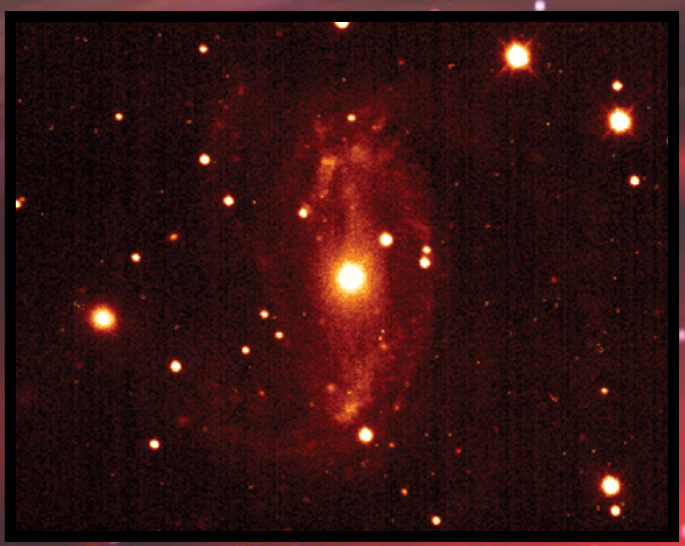
ABSTRACT:

NuSTAR recently observed two bright Seyfert 1 galaxies, namely MCG +8-11-11 (100 ks) and NGC 6814 (150 ks). The aim of the observations is to investigate the Comptonization mechanisms acting in the innermost regions of AGN and which are believed to be responsible for the UV/X-ray emission. We present the analysis of the *NuSTAR* data. We found a precise cutoff measurements, a relativistic broadened FeKα line with disk reflection component, a narrow FeKα line produced in distant Compton thin material.



MCG +8-11-11

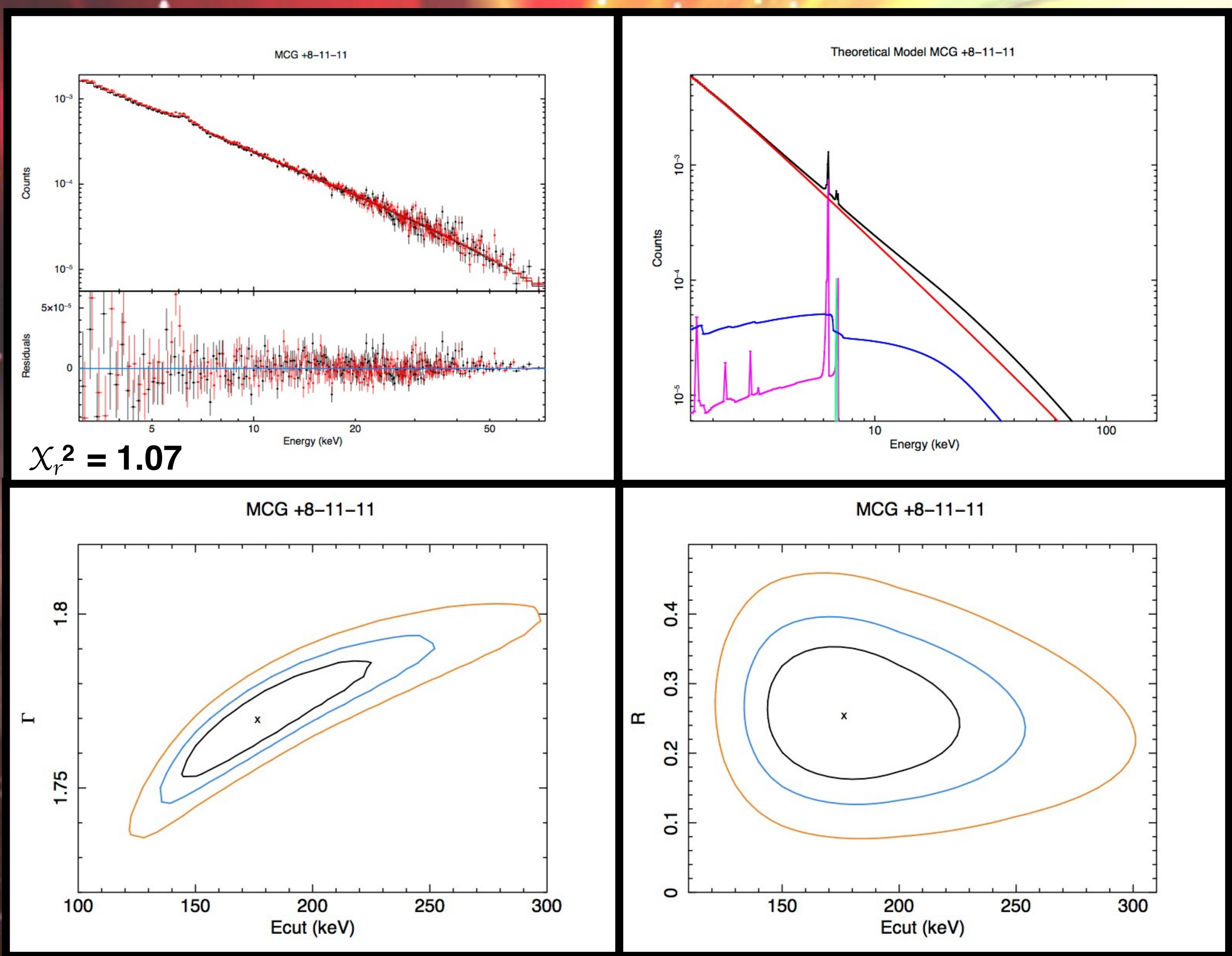
MCG +8-11-11 (z=0.0214) is a bright AGN in the X-ray band, with a $F_{20\text{-}100keV}$ =8.46×10^{-11} erg cm^{-2} s^{-1} (Malizia et al., 2012). It has a log(M_{BH}/M_{sun}) = 8.07±0.2 (Winter et al., 2010) and an Eddington ratio η=0.01.

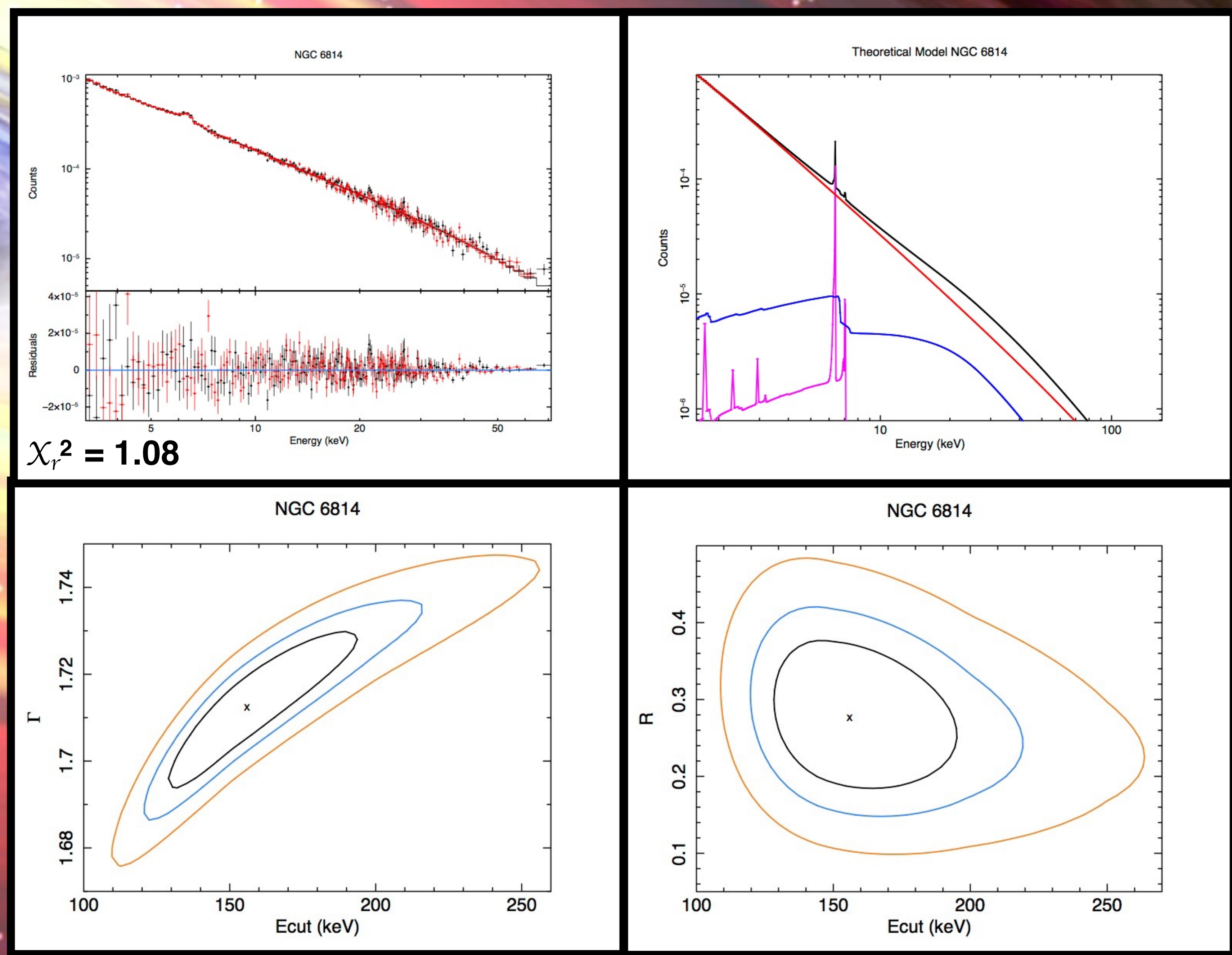
NGC 6814

NCG 6814 (z=0.0051) is a bright AGN with a flux in the X-ray band of $F_{20\text{-}100\ keV}$ =5.66 ×10^{-11} erg cm^{-2} s^{-1} (Malizia et al., 2012). It has a log(M_{BH}/M_{sun}) = 7.0±0.3 (Pancoast et al. 2015) and an Eddington ratio η=0.09.

$$E_C = 180^{+110}_{-50}\,\mathrm{keV}\ \Gamma = 1.77 \pm 0.04\ R = 0.25 \pm 0.12$$

$$E_C = 155^{+70}_{-35}\,\mathrm{keV}\ \Gamma = 1.71 \pm 0.04\ R = 0.27^{+0.10}_{-0.12}$$





We show in the pictures above the fits of the 3-80 keV *NuSTAR* FPMA and B data, best fit and residuals for both sources. The fit is obtained with a model (top right panels) composed by a cutoff power law in red, a relativistic disk reflection component in blue (RELXILL model in XSPEC, García et al., 2014), a cold, distant reflection component in magenta (XILLVER model in XSPEC, García & Kallman 2010; García et al. 2013) and, only for MCG +8-11-11, the Fe XXVI emission line in green. The bottom panels show the E_c-Γ (left) contour plot and E_c-R contour plot (right) are shown, for both sources, for the *NuSTAR* observation. The solid black, blue and orange curves refer to the 68, 90 and 99% confidence levels, respectively.

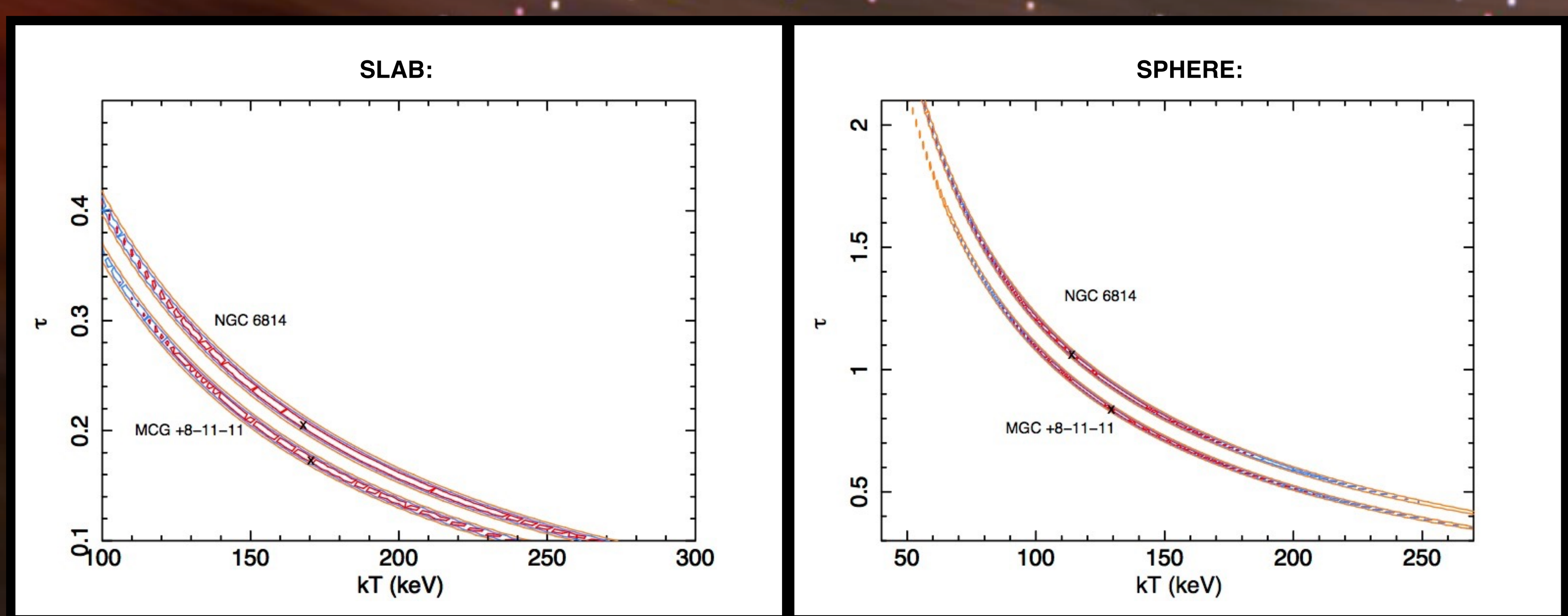
CORONAL PARAMETERS:

SLAB:

$$kT_e = 170^{+150}_{-70}\,\mathrm{keV}$$
$$\tau = 0.17 \pm 0.1$$

SPHERE:

$$kT_e = 150^{+80}_{-70}\,\mathrm{keV}$$
$$\tau = 0.7^{+0.7}_{-0.3}$$



SLAB:

$$kT_e = 165^{+100}_{-50}\,\mathrm{keV}$$
$$\tau = 0.2^{+0.30}_{-0.15}$$

SPHERE:

$$kT_e = 110^{+100}_{-70}\,\mathrm{keV}$$
$$\tau = 1.1^{+0.3}_{-0.8}$$

Coronal temperature versus optical depth contour plots in the case of slab (left) and sphere (right) geometry of the corona. We used a model composed by REFLECT model in XSPEC convolved with COMPTT in XSPEC (Titarchuk 1994) model to fit the data. The solid red, blue and orange curves refer to the 68, 90 and 99% confidence levels, respectively.

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