

Penetrating the Deep Cover of Compton Thick AGN

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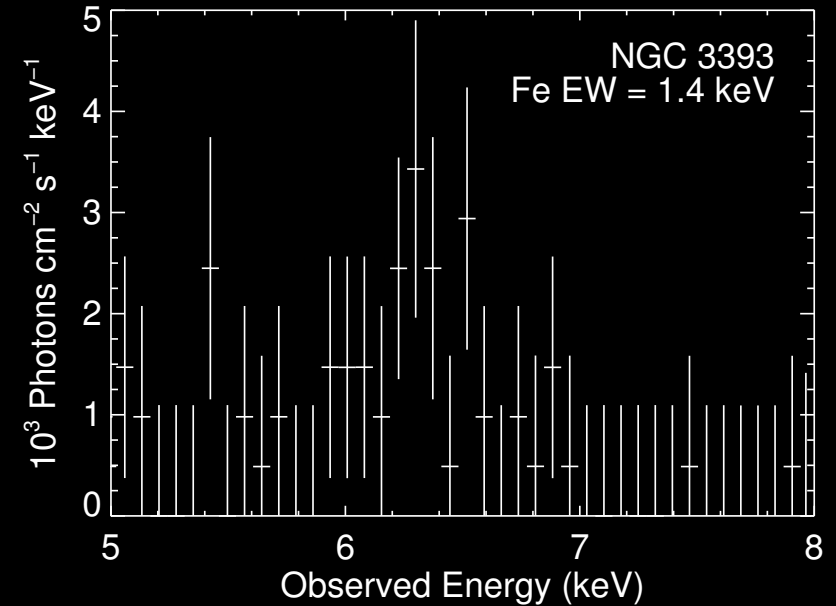
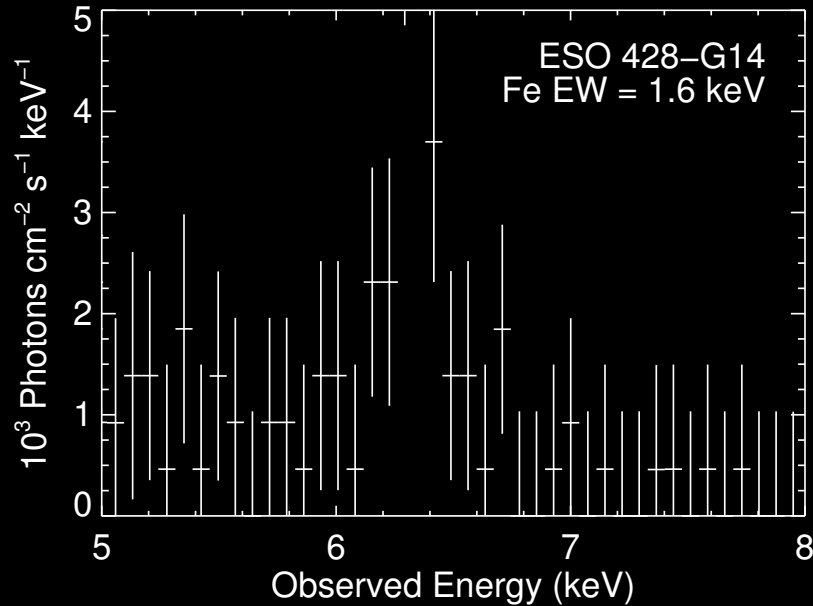
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Compton Thick AGN

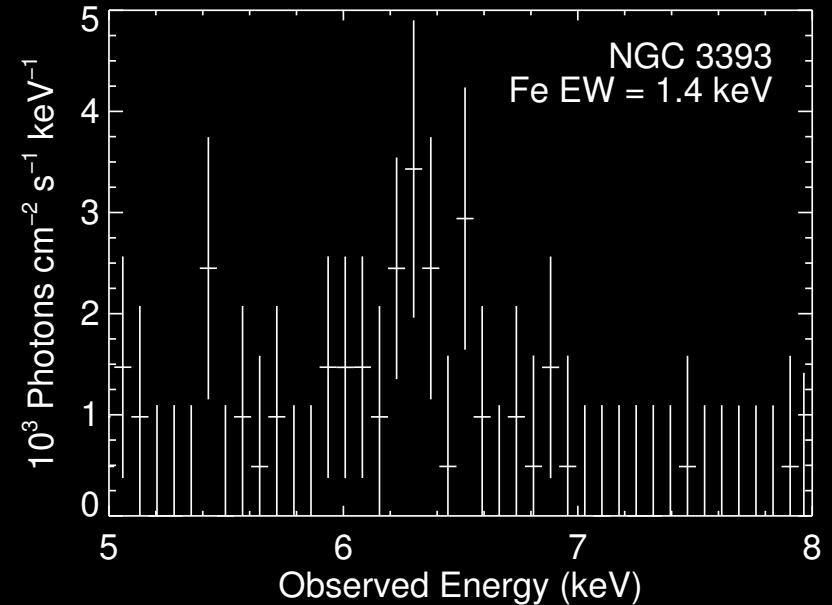
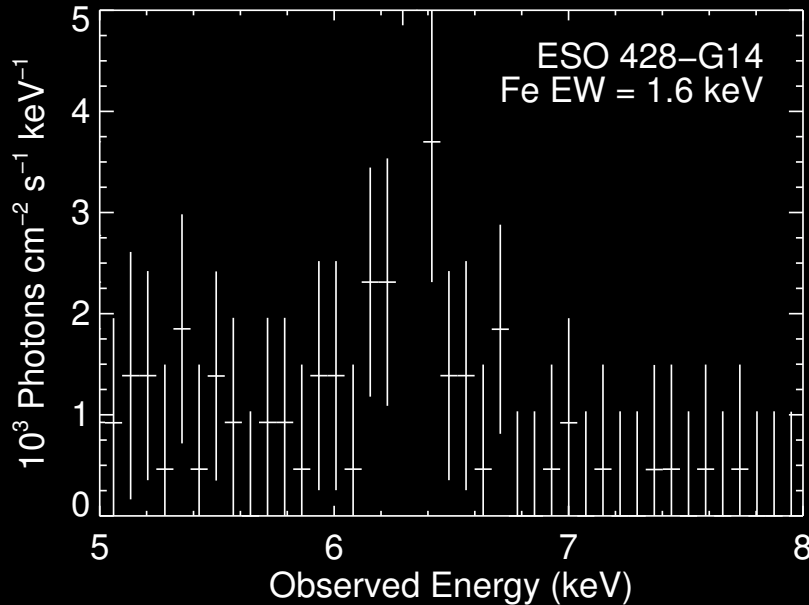
- $N_{\text{H}} > 1.5 \times 10^{24} \text{ cm}^{-2}$
- significant fraction of local AGN
- illustrate full variety of AGN-produced X-rays
- Here: case studies of 3 nearby Compton thick Seyferts
20 – 60 Mpc distance, ≈ 30 ks Chandra exposures
no contamination from starbursts

Hard Spectra



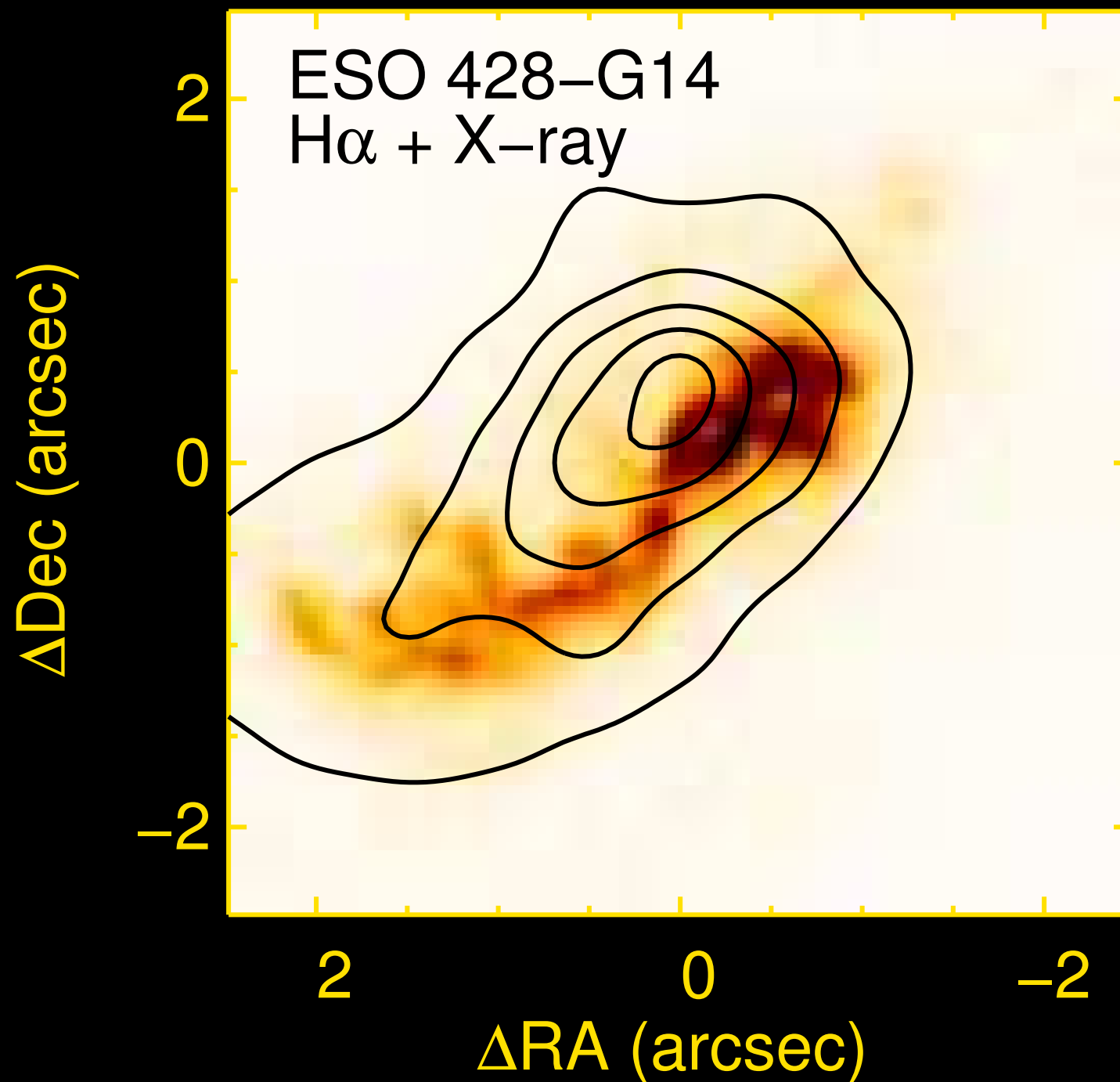
- pure reflected AGN spectra
- large EW Fe $K\alpha$

Hard Spectra



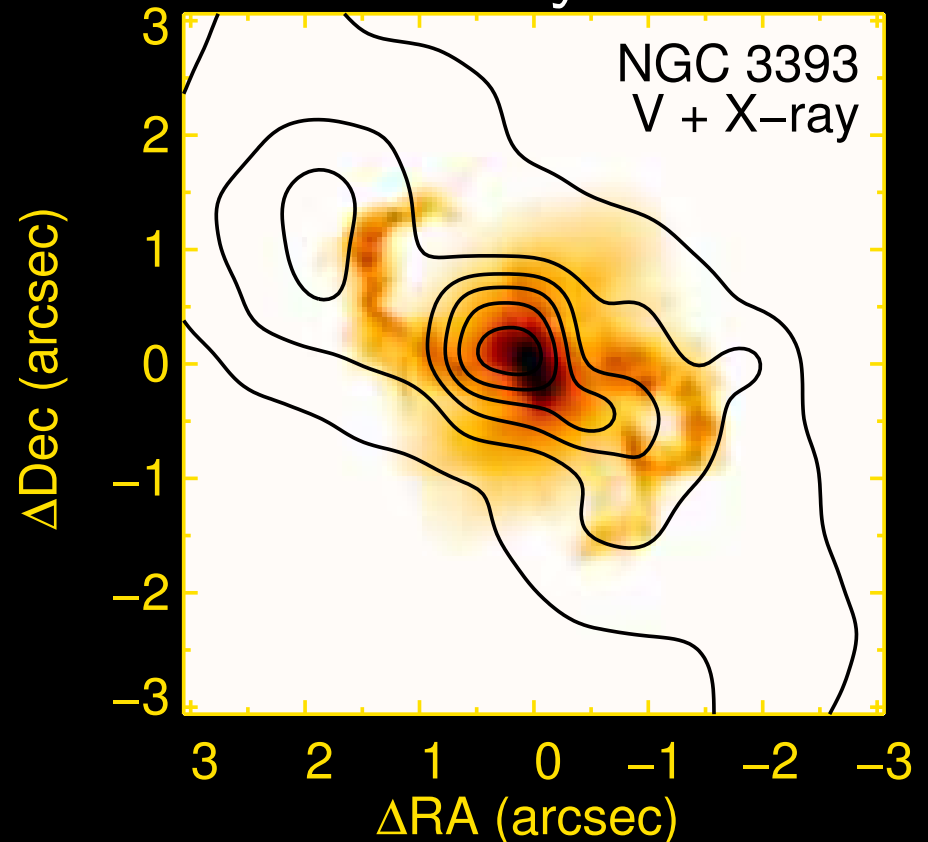
- pure reflected AGN spectra
- large EW Fe K α
- recover intrinsic L_{AGN} from Fe line luminosity
 - $2\text{--}10 \text{ keV } L_{\text{AGN}} \approx 500 \times L_{\text{Fe}}$
 - directly detect only 1% of intrinsic X-ray emission
- luminosity emerges in far-infrared band

X-rays and the Optical Narrow Line Region

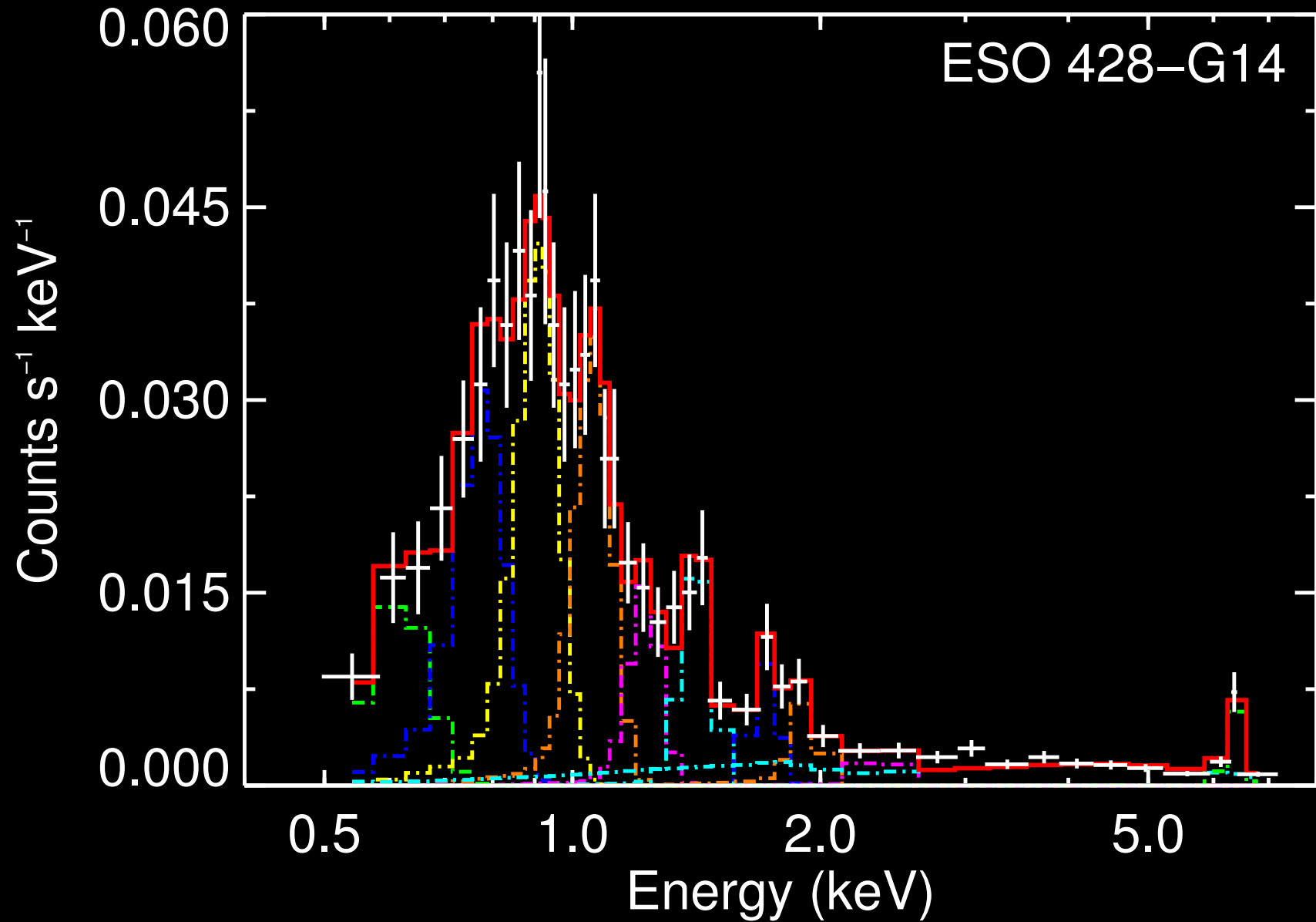


X-rays and the Optical Narrow Line Region

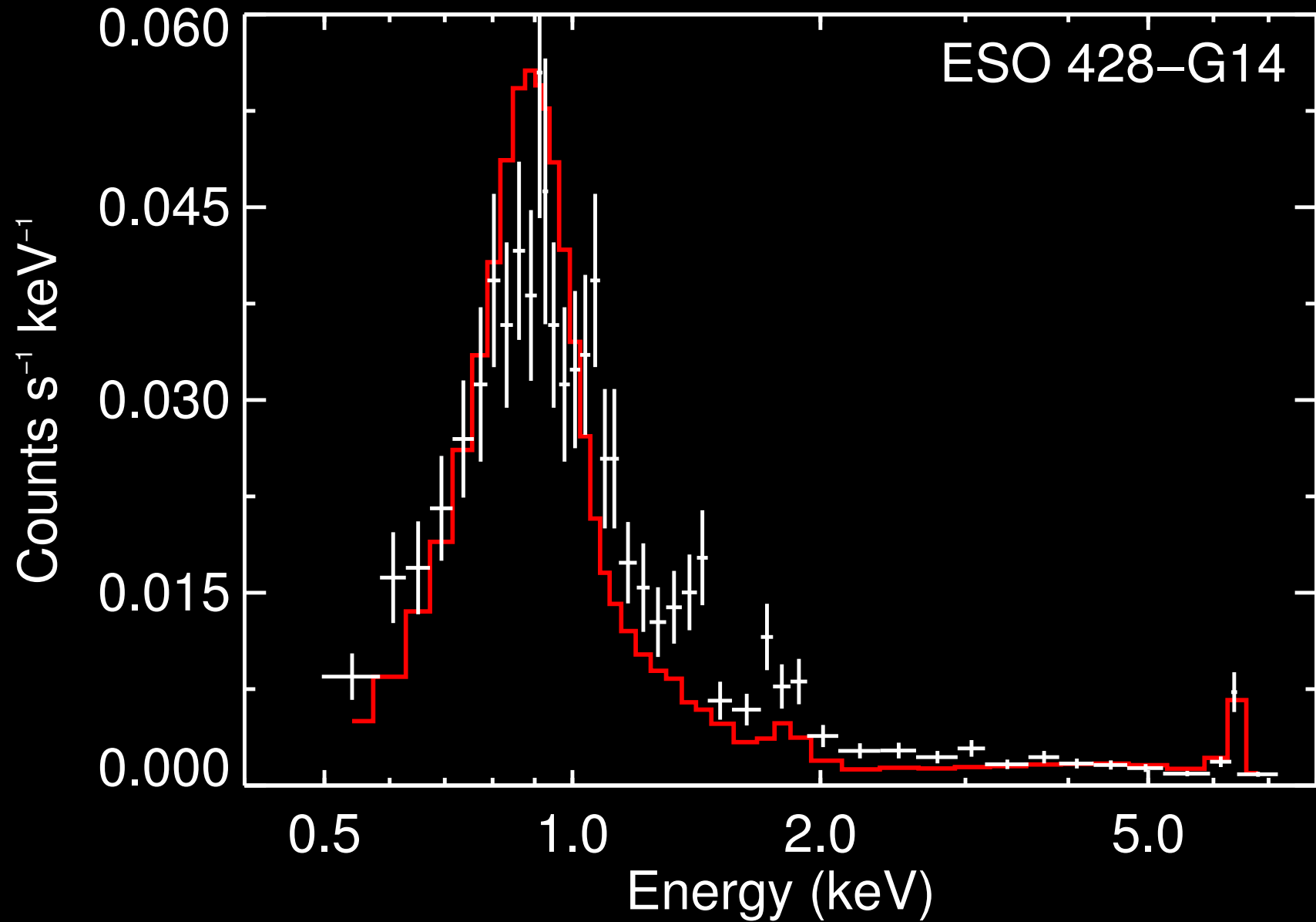
- similar morphology of NLR and X-rays
- NLR luminosity \gg soft X-ray luminosity
- emission regions related to warm absorbers, but not identical
- photoionization origin of both NLR and X-rays



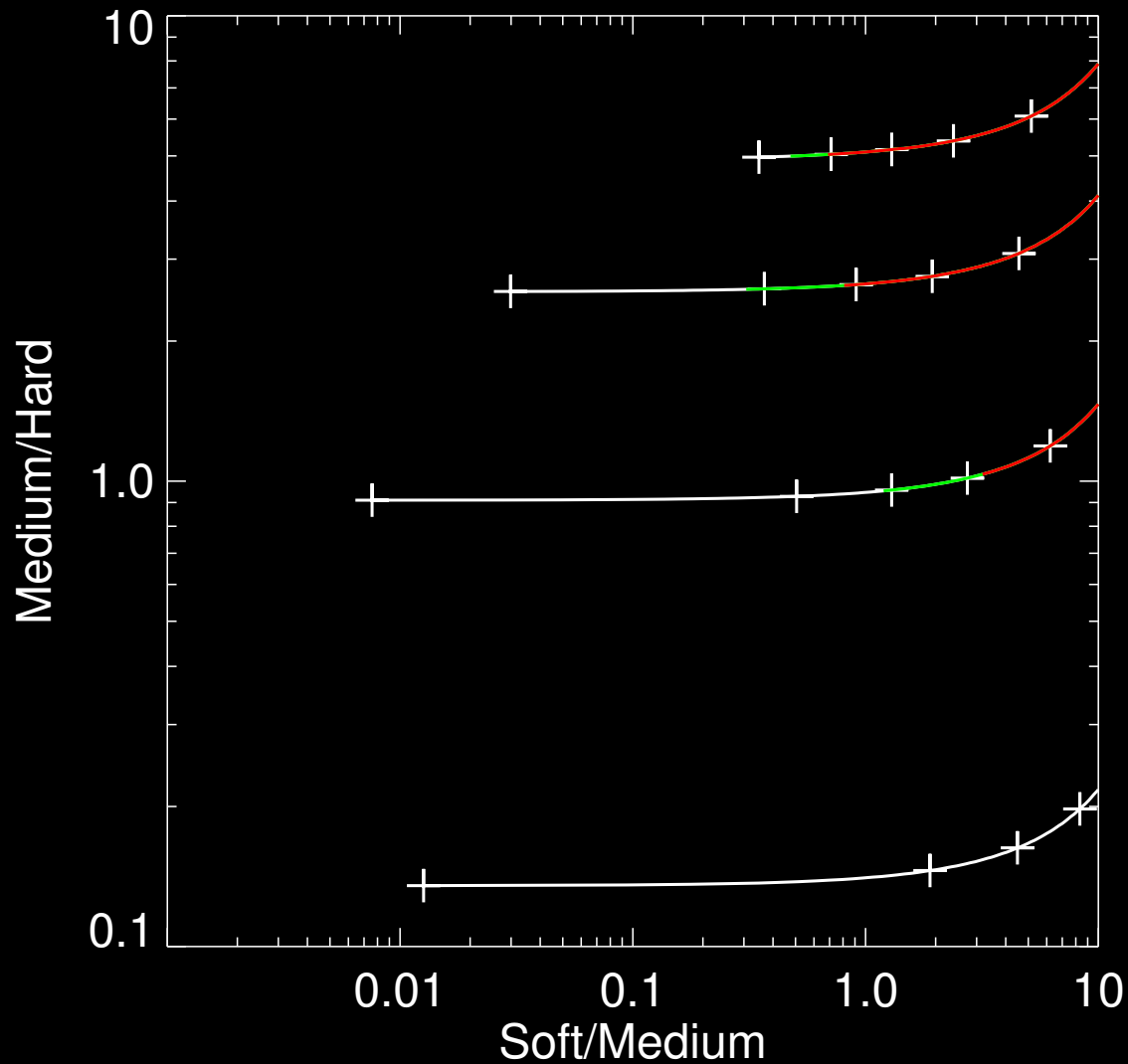
Photoionized Lines



Photoionized Lines – Not Thermal Emission



Three-Color X-ray Diagnostic



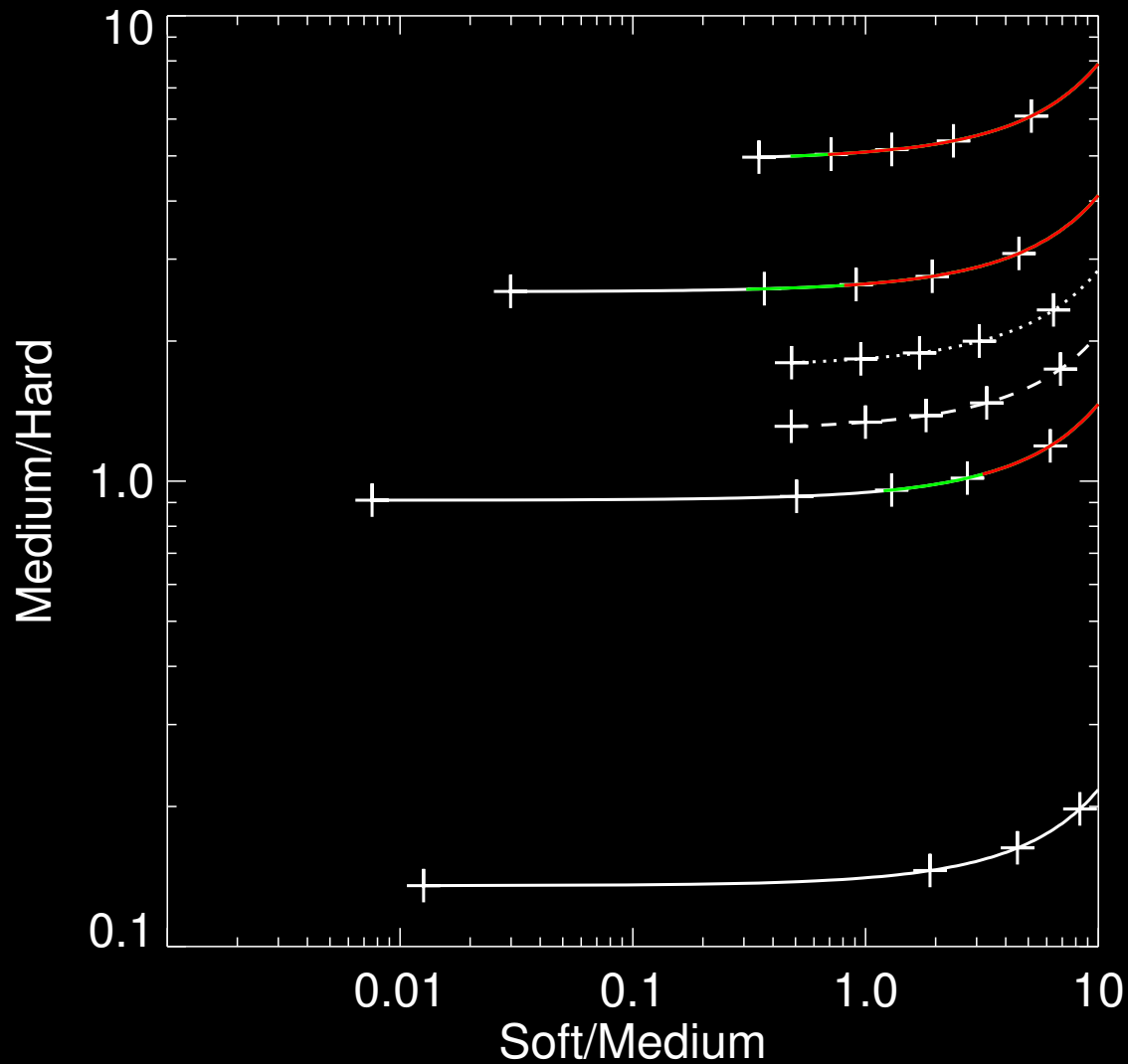
$\log N_H = 22.5$

$\log N_H = 23$

$\log N_H = 23.5$

$\log N_H = 24$

Three-Color X-ray Diagnostic

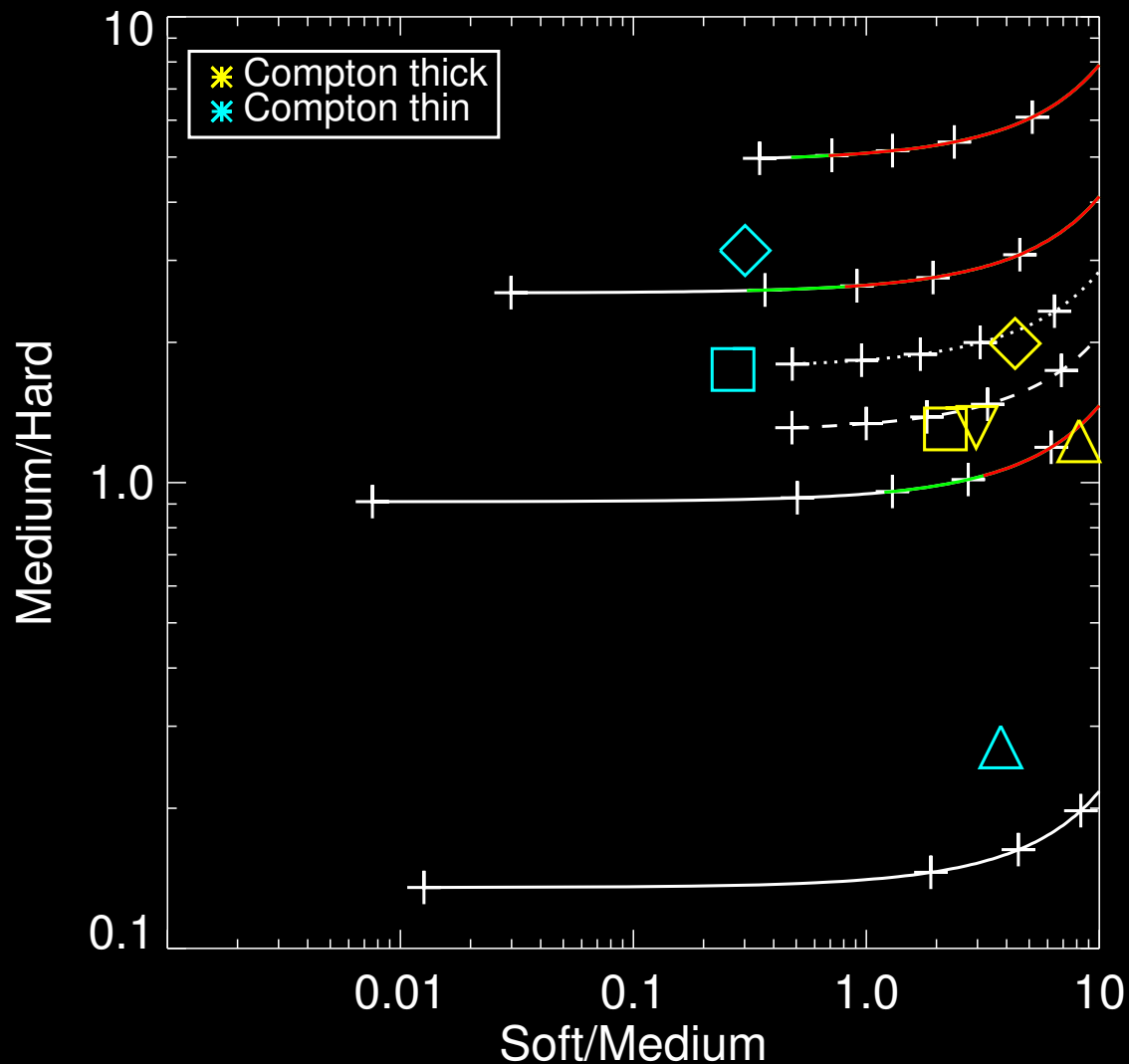


$$\log N_{\text{H}} = 22.5$$

reflection model
reflection model + FeK

$$\log N_{\text{H}} = 24$$

Three-Color X-ray Diagnostic



$\log N_H = 22.5$

reflection model
reflection model + FeK

$\log N_H = 24$

Conclusions

- Nearby examples illustrate variety of AGN X-rays
- Fe $K\alpha$ large EW
 - L_{AGN}
 - only 1% intrinsic hard X-ray L_{AGN} is detected
- soft X-rays = photoionized lines
 - not continuum, not thermal
 - correspond to optical narrow line regions
- 3-band diagnostic diagram identifies Compton thick