

# Measures of The Soft X-ray Excess as an eigenvector 1 parameter For Active Galactic Nuclei

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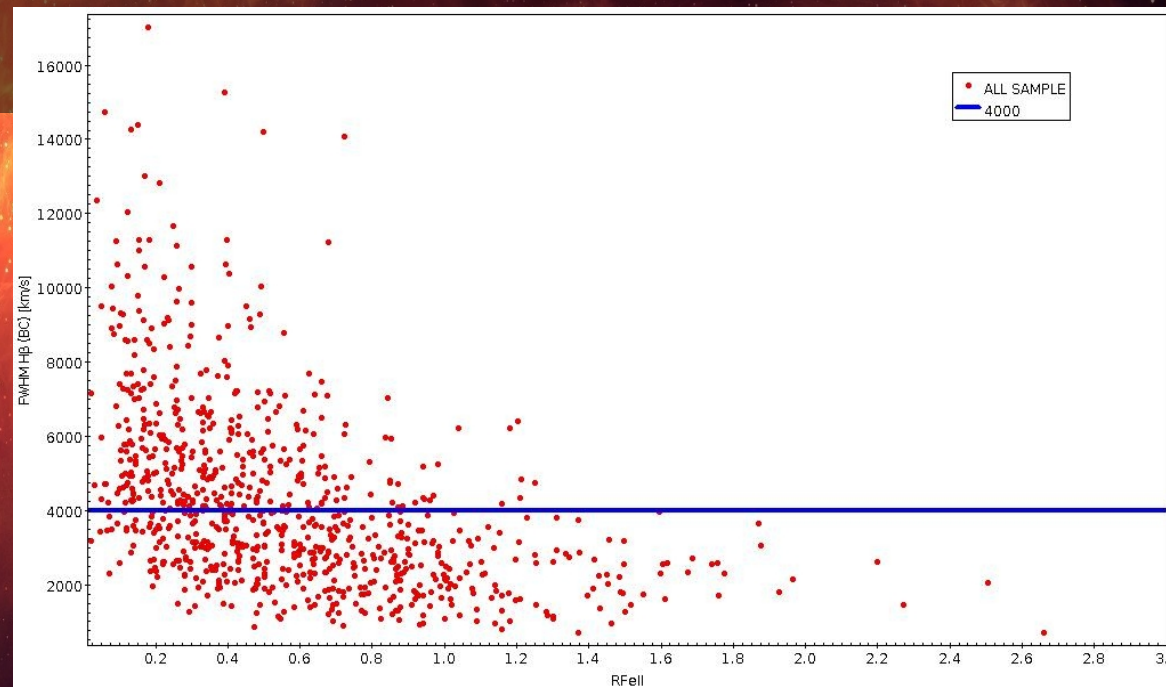
# QSO Populations A & B

813 Type 1 Quasars  $z < 0.8$  with accurate measurements of:

$$\text{FWHM H}\beta_{\text{BC}}$$
$$R_{\text{FeII}} = W(\text{FeII } 4570) / W(\text{H}\beta_{\text{BC}})$$

Zamfir et al. (2010), Sulentic et al. (2007) and Marziani et al. (2003) and Grupe et al. (2004)

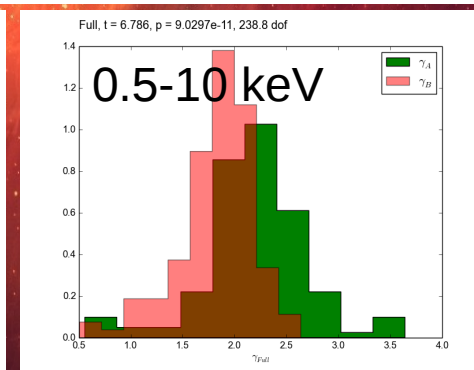
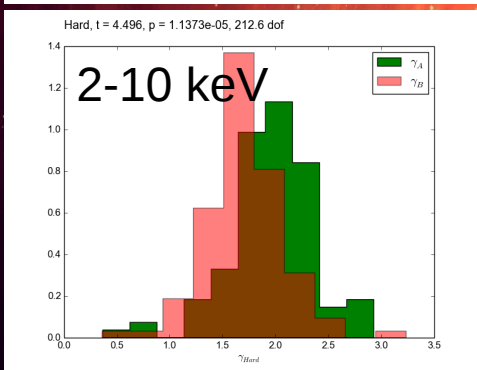
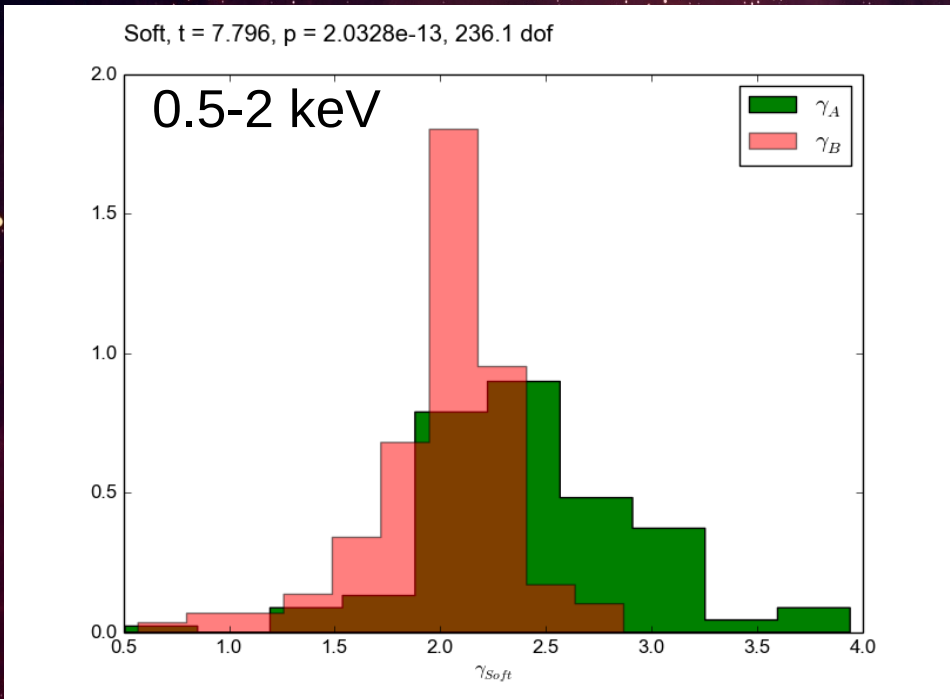
Population A vs Population B  
FWHM  $\text{H}\beta_{\text{BC}} \leq 4000$  km/s      FWHM  $\text{H}\beta_{\text{BC}} > 4000$  km/s



# The Spectral index distribution

~260 Type 1 Quasars

The XMM-Newton spectral-fit database  
XMMFITCAT (Corral et al. 2015)



Parameter	Quartile 1	Median	Quartile 3	Sources
Pop A				
$\Gamma_{FULL}$	1.952	2.183	2.474	133.000
$\Gamma_{SOFT}$	2.121	2.384	2.730	133.000
$\Gamma_{HARD}$	1.712	2.001	2.176	107.000

Pop B				
$\Gamma_{FULL}$	1.642	1.903	2.050	126.000
$\Gamma_{SOFT}$	1.876	2.041	2.213	128.000
$\Gamma_{HARD}$	1.522	1.744	1.921	112.000

Kolmogorov-Smirnov test:  
Pop A and Pop B are statistically different

(probabilities of being the same  $< 7.3 \times 10^{-8}$ )

Student's t-test confirmed the result:

(t statistics of 7.8, 4.5 and 6.8 for  
 $\Gamma_{SOFT}$ ,  $\Gamma_{HARD}$  and  $\Gamma_{FULL}$ )