

Spectral study at different epochs of the Seyfert 1.5 galaxy NGC 4151

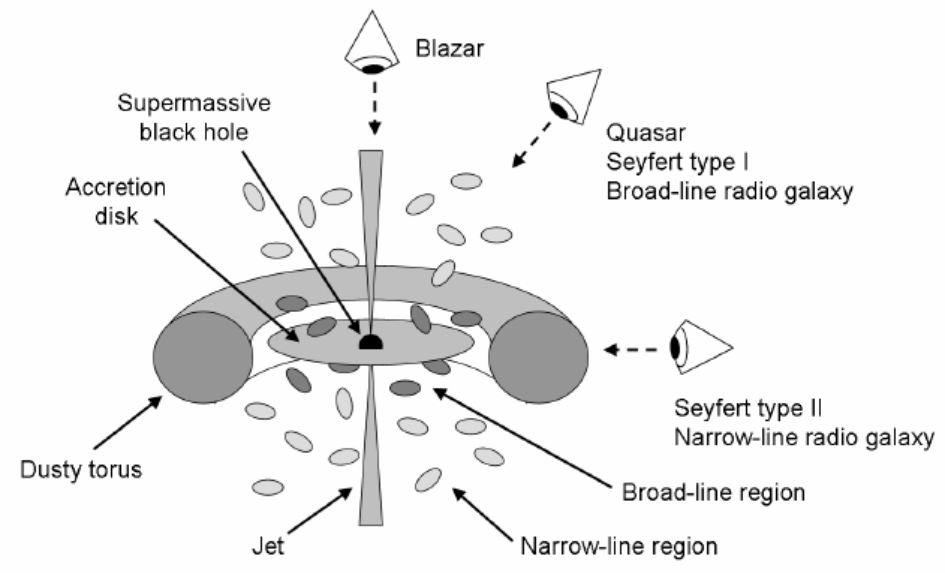
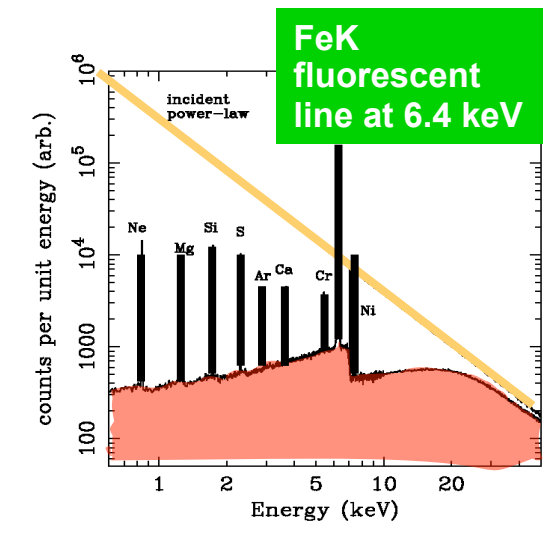
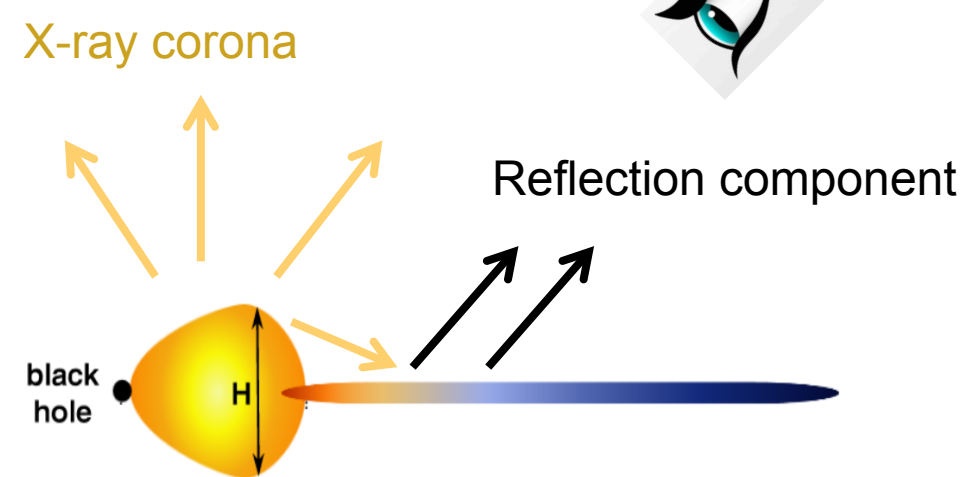


AIM OF THIS LAB

X-ray spectra taken at two different epochs with *XMM-Newton*



Inner regions...



Global view of Seyferts...

PLAN – Spectral study

Goals:

- 1) Obtain a best-fit model of the *XMM-Newton*/EPIC/pn spectrum in the 2-10 keV band of one of the two epochs and infer how far from the SMBH the FeK α is produced
- 2) Test the same best-fit model on the other observation and check which parameters are different and the origin of the variability (i.e. absorption, intrinsic, ...)
- 3) Optional: test relativistic models for the FeK α and reflection component

First steps

1) Extract image, light-curve and spectrum of the source, and fit the “hard” X-ray ($E=2-10$ keV) spectrum

1a) Using a simple power-law model, try to identify the major spectral components (partial covering, reflection, emission features)

1b) Model the FeK α emission line

1c) use self-consistent reflection models (pexmon,...)

Second phase.....

2) Use the best-fit model obtained in the first case and test it on the second observation;

2a) check if the model is physically motivated → Pinpoint the variable components between the two observations;

2b) infer a scenario able to globally explain what is observed in the two datasets.

Optional.....

Use relativistic kernel on the reflection component and check if the results are significantly different from what obtained with the simple reflection component

NGC 4151

References:

Paper: De Rosa et al. 2007, A&A, 463, 903
Beuchert et al. 2017, A&A, 603, A50

Source INFOs

Classification: Seyfert 1.5

$z=0.0033$

$M \sim 3.7 \times 10^7 M_{\odot}$ (Onken et al. 2014)

$N_{\text{h,gal}} = 2.5 \times 10^{20} \text{ cm}^{-2}$ (Kalberla et al. 2005)