Spectral study of a changing-state Seyfert 1 galaxy called H0557-385

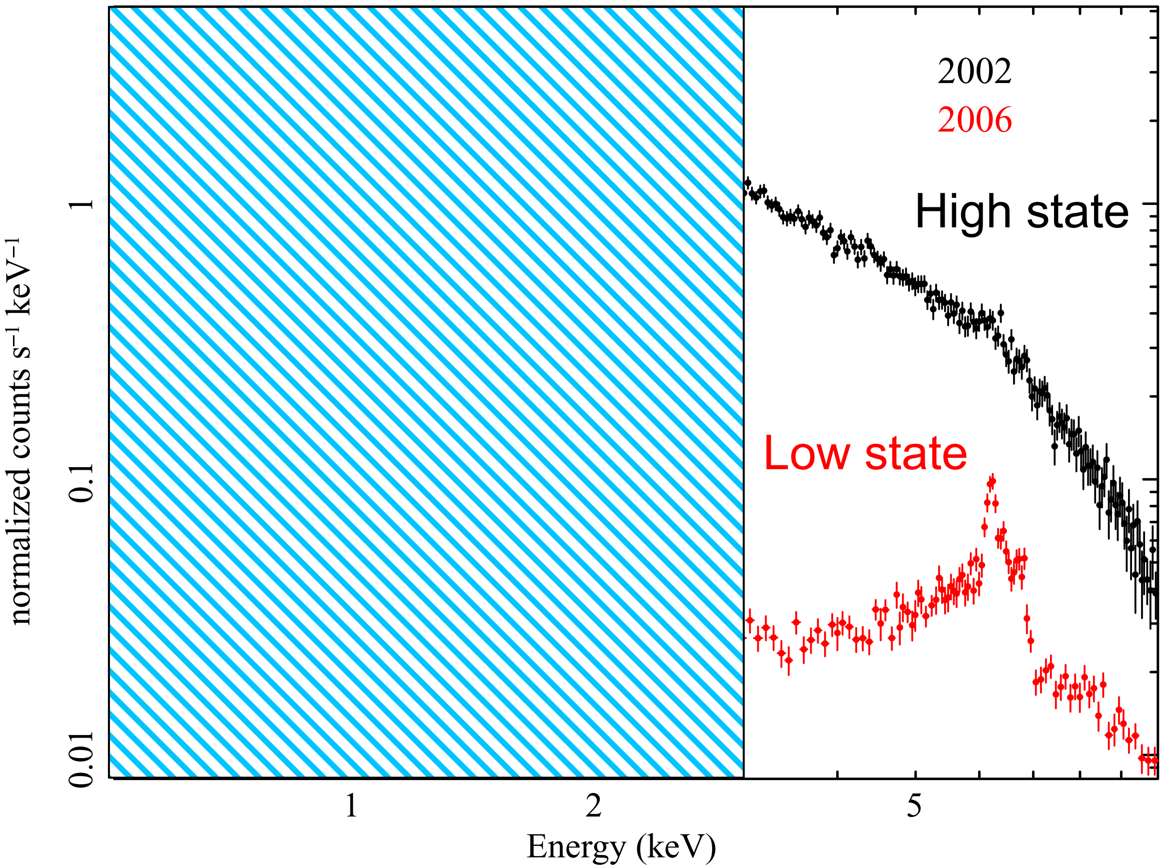
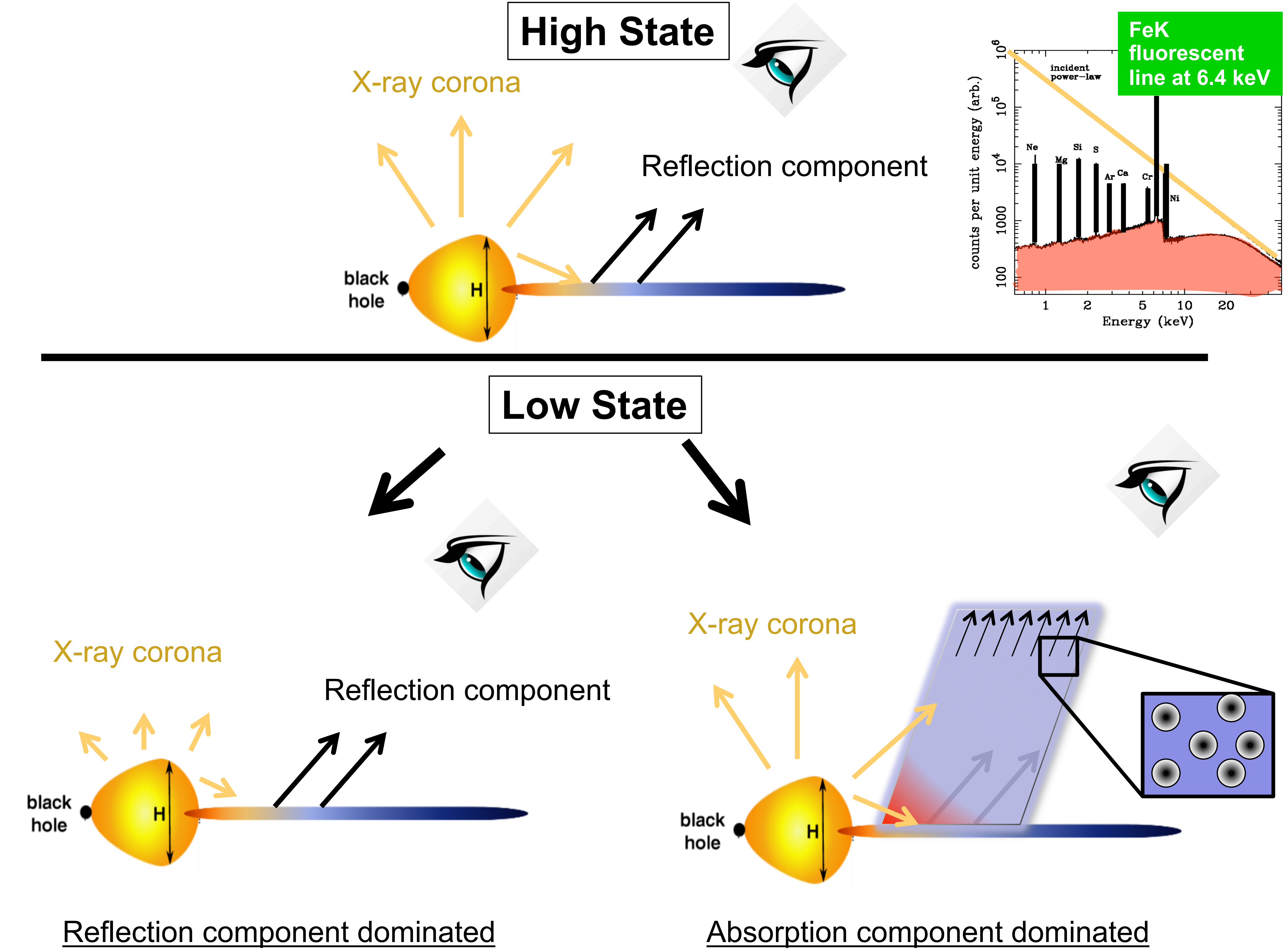


Figure 1. EPIC pn spectra of H0557−385 in 2002 and 2006.

AIM OF THIS LAB

(A two state spectrum…)

→ Understand (if possible) whether (intrinsic) X-ray source emission has shut-off, and only the reflection component is left, or the source has experienced strong (wind?) absorption


High State
X-ray corona
Reflection component
black hole
H
FeK fluorescent line at 6.4 keV
incident power−law
counts per unit energy (arb.)
Energy (keV)
Ne
Mg
Si
S
Ar
Ca
Cr
Ni
Low State
X-ray corona
Reflection component
black hole
H
X-ray corona
black hole
H
Reflection component dominated
Absorption component dominated

PLAN – Spectral study

Goals:

1) Obtain a best-fit model for the high state spectrum 3-10 keV)

2) Obtain a best-fit model for the low state spectrum (3-10 keV) under the reflection-dominated assumption

3) Optional:
- 3a+b: Try, and compare, the absorption-dominated assumption (or viceversa)
- 3c: Extend one of the two spectra down to 0.5 keV

High state......

1) Extract image, light-curve and spectrum of the source, and fit the “hard” X-ray (E=3-10 keV) spectrum

1a) Using a simple power-law model, try to identify the major spectral features (emission and/or absorption lines)

1b) Model the FeK emission line, if any

Low state......

2) Extract image, light-curve and spectrum of the source, and fit the “hard” X-ray (E=3-10 keV) continuum

2a) Using a power-law model plus a reflection continuum (neutral, and including FeK emission lines)

Gruppo 1

Gruppo 2

2b) Using a power-law model plus 1 or 2 partially covering models, plus (one or two) narrow FeK emission lines.

Optional......

2c) compare the two scenarios (reflection dominated vs absorption dominated), i.e. either 2a or 2b.

2d) and/or extend study of one of the two down to 0.5 keV

H0557-385

References:

Longinotti et al. 2009 (http://arxiv.org/abs/0810.0918)
Coffey et al. 2014 (http://arxiv.org/abs/1406.7129)

Source INFOs:

Classification: Seyfert 1.2

Z=0.03387 (10154 km/s)

M=5x10^7 M$_\Theta$

Nhgal=3.7x10^{20} cm^{-2} (Kalberla et al. 2005)