X-ray/UV observation of the Seyfert 1 galaxy 1H0419-577

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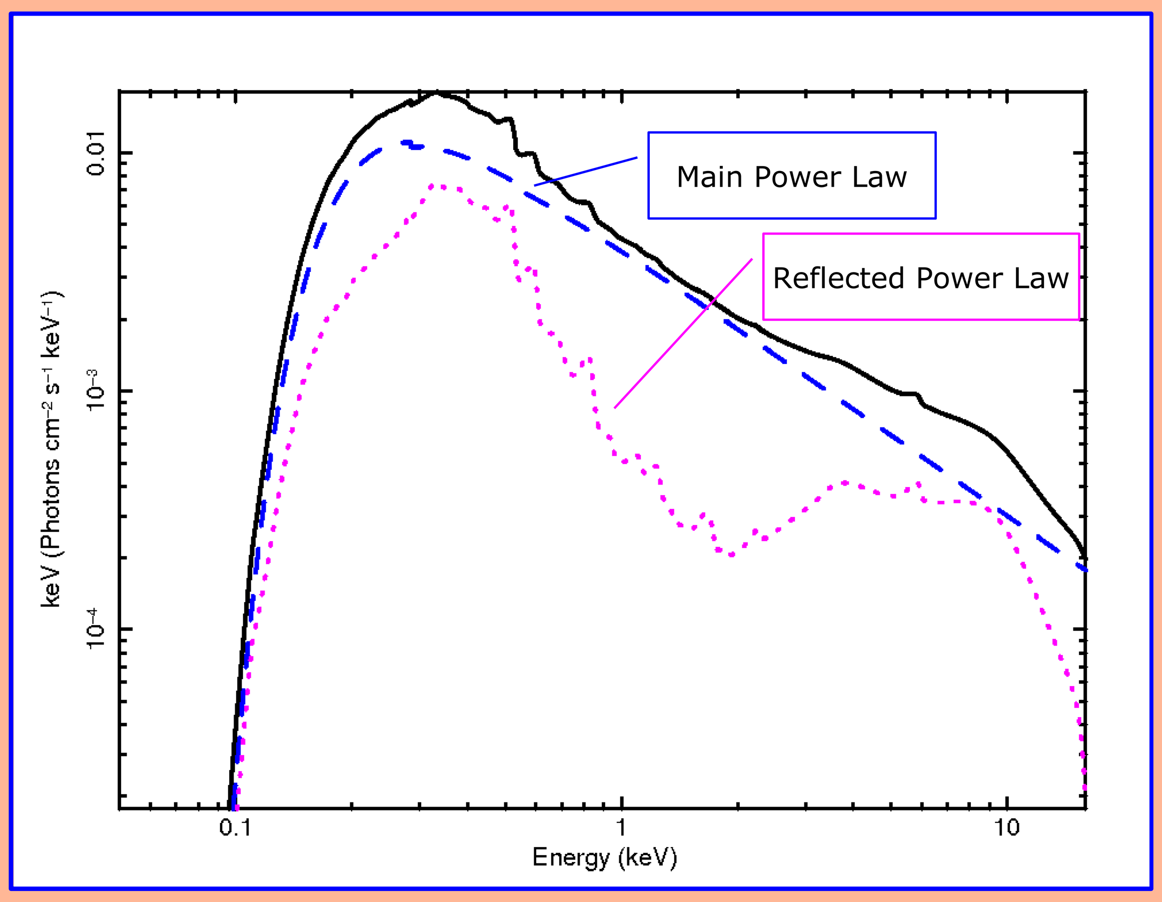
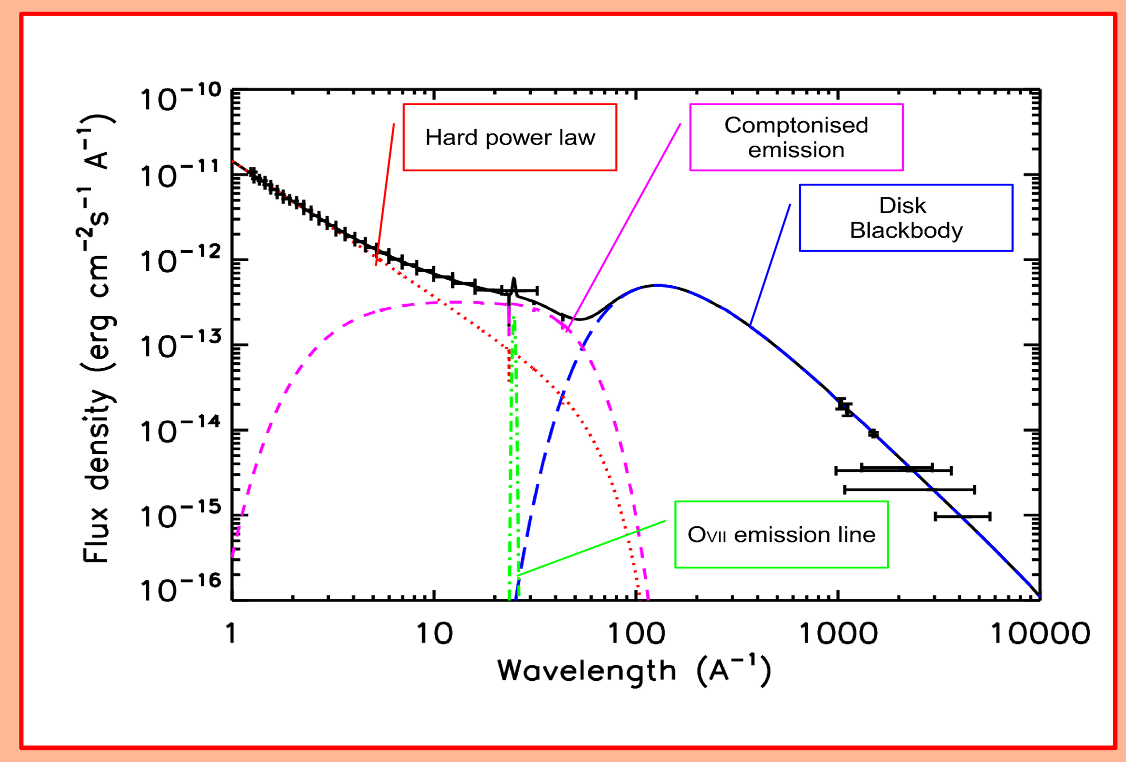
Broadband spectral modeling:



Reflection model

The X-ray spectrum of 1H0419-577 exhibits a "soft excess" in the 0.5-2.0 keV band that cannot be fitted extending to soft energies the hard (2.0-10 keV) power law. **The soft excess was successfully fitted with a reflection model** by *Fabian et al 2005, MNRAS, 361, 795*; we modeled the spectrum with the same approach, finding a viable fit where the 44% of the flux of the main power law is reflected in the inner disk. The spectral shape of the reflected power law is strongly altered by the relativistic blurring, producing the excess of flux at soft energy.

We also modeled the broadband optical-UV (XMM-OM, HST/COS, FUSE) and X-ray (EPIC-pn) SED of the source with a Comptonisation model, as done for other sources (*Mehdipour et al 2011 A&A, 616, 696 ; Chichuan et al 2011, arXIV:1205, 1846)*. **A model where the soft excess is due to up-scattering of the optical-UV disk photons in a warm plasma fits the data as well.** The model includes a disk-blackbody in the optical-UV with the temperature coupled to the one of the seed photons of the Comptonisation model. Variations in the optical thickness of the Comptonising plasma might explain the spectral variability of the source (*Di Gesu et al, in prep*).



Comptonisation model

Results:

The broadband spectral modeling suggests that Comptonisation is a possible explanation of the soft X-ray emission.

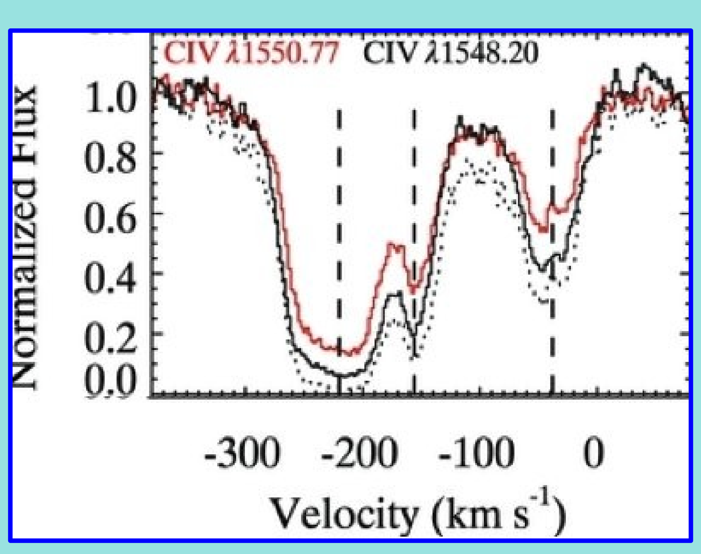
COS and RGS high resolution spectra show that UV and X-ray absorption lines are likely to be produced by the same outflowing gas.

X-ray UV lines photoionization modeling:

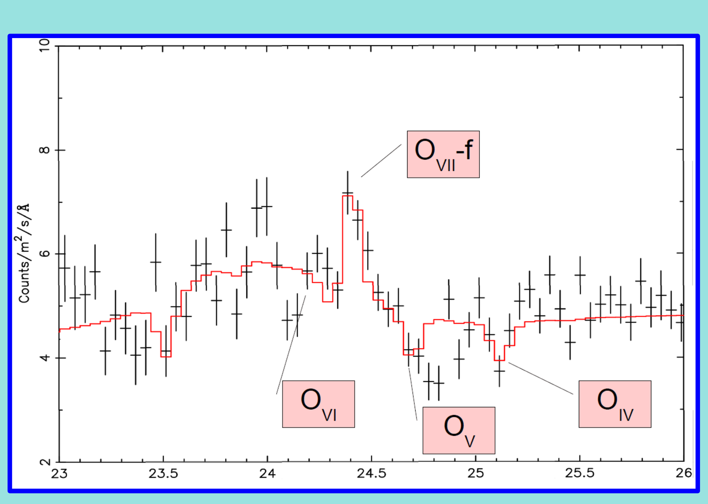
HST/COS

Simultaneous

XMM/RGS (158 ks)



Absorption lines from the C_{IV} doublets. Three kynematic components (dashed vertical lines) are detected in both the doublets lines (red and black line,following the color legenda indicated.)



Zoom over the 23 A-26 A spectral region. Many local oxygen emission and absorption lines are labeled. The underlying broad emission line is a blend of the lines of the O_{VII} triplets.

Lines fitting. Photoionization codes.

outflow velocities : v_{out}
ionic column densities : N_{ion}
global column densities : N_H
gas ionization parameter : $\xi = \frac{L}{nR^2}$

Lines fitting. Photoionization codes.

UV Results:

Outflow:

V_1=-38 Km s^{-1}
V_2=-156 Km s^{-1}
V_3=-220 Km s^{-1}

Gas parameters:

logξ=[-0.3 +0.1]
log$N_{O_{VI}}$=[15.83-15.96]

Consistent

X-ray results:

Outflow:

Not resolved:
V≥-41 Km s^{-1}

Gas parameters:

logξ=[-0.15 +0.12]
log$N_{O_{VI}}$=[15.84-15.92]

The COS high resolution spectrum showed three kinetic outflow components (*Edmonds et al 2011, Apj, 739,7*). Absorption lines from the O_{VI} were detected in both the X-ray and the UV band, and the derived column densities are consistent with each other. As the same holds for the absorber ionization parameter, we can state that **UV and X-ray absorption lines are likely to be produced by the same gas.**

The photoionization modeling of the UV narrow emission lines showed that they arise from a denser (logN_H=21.63 +/-0.02) and more highly ionized (logξ=0.46+/-0.01) gas than the UV/X-ray absorber. Although we have no strong constraint on the gas parameters, the analysis suggested that the X-ray emitting gas should be from a third, even more highly ionized (logξ≥0.80) gas phase. Thus, twe were able to disentangle three gas phases, like to arise in different AGN regions.