Iron-K Line Diagnostics from Chandra Grating Observations of AGN

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Abstract

We review the results from high-resolution spectroscopy of the Fe-K region in active galaxies using the *Chandra* High-Energy Gratings. A narrow, previously unresolved, Fe-K line component is detected in several Seyfert 1 galaxies. We present measurements of the centroid energy, width and EW (and upper limits for non-detections) of these lines, which likely arise in the BLR and/or the putative obscuring torus. We describe a program to use the grating line measurements to correctly model the relativistically broadened Fe-K lines observed with *ASCA*, *RXTE* and *XMM*. We compare the Seyfert 1 grating measurements of the Fe-K lines with those of the few Seyfert 2's that are available so far. Despite the low effective area of the *Chandra* gratings in the Fe-K band, we present the first significant detection of a *broad* Fe-K line with *HETG* in one of the Seyfert 1 galaxies in our sample. Finally, we discuss how future improvements in energy resolution in the Fe-K band, with *ASTRO-E2* and *Constellation-X* may be able to constrain the black-hole mass and spin without being afflicted by the problems associated with reverberation mapping of the accretion disk.

CATEGORY: ACTIVE GALAXIES AND QUASARS