

INFLUENCE OF BLACK HOLE SPIN ON THE SHAPE OF THE Fe K α SPECTRAL LINE

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Nowadays it is widely accepted that the Fe K α spectral line, which is observed in the X-ray spectra of a number of Active Galactic Nuclei (AGN), is probably emitted from a very compact region near their central supermassive black hole. Here we analyze the effects of black hole spin on the shape of the line using numerical simulations of disk emission based on ray-tracing method in Kerr metric. Since the complex profile of the line depends on different parameters and in order to separate contribution of black hole spin, we performed simulations for a grid of input parameters, such as radii of the line emitting region, disk inclination and angular momentum (spin) of central black hole. Obtained results show that the red peak of the Fe K α line is much brighter in the case of almost maximally rotating black hole, but at the same time it is also more embedded into the blue peak wing, and hence less separable from it. Consequently, angular momentum of the rotating central black hole has significant influence on the line shape, and therefore the corresponding deformations in the observed spectra of some AGN can be used for measuring the spin of their central black holes.