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Constraining the geometry of the corona with relativistic reflection modeling

The irradiation of the innermost accretion disk by X-rays emitted by the corona produces characteristic reflection features. Besides depending on the density and ionization of the disk itself, also the spin of the black hole and the corona itself is imprinted on the reflection spectrum due to strong relativistic effects. When fitting observational data of black hole X-ray binaries and AGN, relativistic reflection models assuming a point-like lamp post corona were very successful, which is challenged by recent polarization measurements. We present a new reflection model in the relxill framework, which implements a radially extended disk-like corona. We show how a more self-consistent approach to relativistic reflection modeling allows to better constrain the accretion flow, including the geometry of the corona. This self-consistent approach means that starting from the corona we directly predict the continuum emission and the irradiation of the accretion disk, including the ionization gradient and the resulting reflection including returning radiation. To obtain constrains on the radial extent of the corona, the newly developed model is applied to observed spectra of well known black holes with strong reflection

Contribution

Oral talk

Affiliation

Remeis Observatory & ECAP, FAU

E-mail

thomas.dauser@gmail.com

Author: DAUSER, Thomas (Remeis Observatory & ECAP, FAU)

Co-authors: Mr NEKRASOV, Alexey (Remeis Observatory & ECAP, FAU); WILMS, Jörn (Remeis Observatory & ECAP); GARCÍA, Javier (NASA GSFC)

Presenter: DAUSER, Thomas (Remeis Observatory & ECAP, FAU)

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