

Abstract SF2A:
Application of the JED-SAD model:
From X-ray binaries to AGN

Barnier, S; Petrucci, P.-O.; Ferreira, J.; Marcel, G.; Belmont, R.
Clavel, M.; Corbel, S.; Coriat, M.; Henri, G.; Malzac, J.
and Rodriguez, J.

March 2022

While a scientific consensus has emerged concerning the Standard Accretion Disk (SAD, Shakura & Sunyaev, 1973) as the origin of the disk emission around accreting black holes, the nature of the inner hot flow (or corona) remains questioned. In 2018, Marcel et al. developed a two-temperature plasma code computing the spectrum of hybrid disks composed of a truncated outer SAD and an inner Jet Emitting Disk (JED, Ferreira 1997, Ferreira et al 2006, Petrucci et al 2008).

We applied the JED-SAD model to X-ray binaries, fitting the hard states of 4 outbursts of GX339-4 and studying simultaneously the radiative properties of the accretion flow and the jet. We are able to correctly fit the X-ray spectra and to reproduce the radio flux at better than 10-15%. Moreover, we show that the functional dependency of the radio emission evolves between the rising and decaying phase of the outbursts.

We also applied the model to Active Galactic Nuclei to reproduce the non linear correlation observed between the UV and X-ray emission. We identified the region of the JED-SAD parameter space able to reproduce the observed AGN samples (Lusso & Risaliti 2020, Liu et al 2021, Zhu et al. 2020). We will discuss the physical interpretations of our results and how they can be linked to X-ray binaries outbursts behavior.