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Radiative GRMHD simulations of sub-Eddington accretion: the Puffy disc

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A widely accepted picture of an accretion flow in the luminous soft spectral state of X-ray binary systems is a geometrically thin disc structure much like the classic analytic thin disc model of Shakura & Sunyaev. Although the analytic models are troubled by instabilities, they are successfully used to interpret observational data. I will present the results of general relativistic radiative magnetohydrodynamic (GRRMHD) simulations of sub-Eddington optically thick accretion on a stellar-mass black hole with a mildly sub-Eddington luminosity, the so-called Puffy disc. The accretion flow is stabilised by the magnetic field, with a puffed-up optically thick region resembling a warm corona surrounding a denser disc core. However, the distinguished vertical structure of the disk has a significant influence on the observable picture of such a system and affects the central black hole parameters obtained using standard tools to interpret observational data.

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