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Time-dependent Kerr discs and tidal disruption events

Wednesday, 7 July 2021 10:10 (40 minutes)

Whilst the classical Novikov and Thorne solutions for steady state black hole accretion discs have been known for nearly half a century, the development of time-dependent relativistic disc theory is relatively new. I will review the formal theory of time-dependent thin discs in Kerr geometry, and argue that analysis of tidal disruption events (the tidal destruction of a star by a supermassive galactic black hole and the subsequent accretion of the debris) is an ideal venue for its application. Late time X-ray observations probe the disc regions near the innermost stable circular orbit, whilst the simultaneous UV emission arises from farther out. The observed steeply falling X-ray light curves together with a simultaneous flat UV plateau are, we shall show, strong support for the basic disc emission model. Nonthermal x-ray emission, conditions of strong variability, and limitations of the thin disc model will be discussed as time permits.

Primary author: BALBUS, Steven

Presenter: BALBUS, Steven

Session Classification: Accretion Discs and Jets

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