Black hole states and radio jet formation

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Abstract

An empirical relation between ‘canonical’ X-ray states in black hole X-ray binaries and radio emission is presented. In the Low/Hard state a quasi-continuous radio-emitting jet is produced. In the High/Soft state the jet is not observed. In the Very High state and at major state transitions, which may correspond physically to rapid and/or significant changes in the inner accretion disc radius, discrete ejection events, which manifest themselves as radio flares, are observed. These relations appear to hold for both transient and persistent systems. Furthermore it is argued that the extremely strong coupling between hard X-rays and radio emission from black hole X-ray binaries implies that the Comptonising corona is simply the base of the jet.