

Tidal disruption events with a relativistic jet

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Abstract

A star or sub-stellar object will be destroyed by tidal forces when it passes close enough by a supermassive black hole (SMBH). These events known as TDEs are expected to produce luminous flare emission in the UV to X-ray band. Recent observations of Sw J1644+57, in particular, suggest that at least some TDEs can launch a relativistic jet. A common speculation is that these rare events are related to rapidly spinning BHs. We constrained the BH spin parameter by using the available data, and found that the BH indeed carries a moderate to high spin, suggesting that BH spin is likely the crucial factor behind the Sw J1644+57-like events. Other observational properties include the rough 2.7 day periodicity in X-ray dips and 200s QPO, which we interpret as due to precession of the jet. In addition, Sw J2058+05 and Sw J1112.2-8238 are also thought to be a TDE with an on-beam relativistic jet. It is natural to expect that there should be some events with off-beam ones. We found that IGR J12580+0134 in the nucleus of NGC 4845 is likely such a case.