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Relativistic line reverberation mapping in tidal disruption events

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When normal stars run close enough to the previously dormant supermassive black holes (SMBHs) at the centres of normal galaxies, they would be entirely or partly disrupted due to the tidal force, leading to the so-called tidal disruption events (TDEs). Part of the debris material will be accreted by the SMBHs later on. The accretion of the debris material would generate X-ray flares, which will illuminate the remaining debris material and would generate spectral line feature in their spectra. Here we show predicted features due to relativistic spectral lines expected to occur during the accretion phase of the debris material. We demonstrate that these spectral features can be used to probe the mass and spin of the SMBHs at the centres of galaxies as well as the accretion geometry and GR effects involved in the TDE events.

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