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Relativistic tidal disruption events: what do we learn from their rate distribution?

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We will report on the discovery potential of relativistic tidal disruption events with current and future instruments and its impact on the SuperMassive black hole mass function and the theory of jet formation.
Relativistic TDEs (or jetted TDEs) are a new class of sources, recently discovered by Swift/BAT, showing a significant radio counterpart of a common tidal disruption event. Observing relativistic TDEs (from previously non-active galaxies) provides us with a new means of studying the early phases of jet formation and evolution in an otherwise pristine environment. Although several (tens) TDEs have been discovered since 1999, only three jetted TDEs have been recently discovered in hard X-rays, and two of them, Swift J1644+57 and Swift J2058+05, have a precise localization which further supports the TDE interpretation. We will discuss how the highest discovery potential for relativistic TDEs is not held by current and up-coming X-ray instruments (only a few to a few tens events per year expected) but by the Square Kilometer Array (SKA). We expect SKA to detect TDEs and trigger multi-wavelength follow-ups, yielding hundreds candidates per year even at high z. Radio and X-ray synergy, however, can in principle constrain important quantities such as the absolute rate of relativistic TDEs, their jet power, bulk Lorentz factor, the black hole mass function, and perhaps cover massive black holes with < 10^5 Msun.

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