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The co-evolution of supermassive black holes and their host haloes

Masses of supermassive black holes (SMBH) are known to correlate with the spheroidal component of their host galaxies according to the so-called M-sigma (Magorrian) relation. A further proposal of a correlation between the SMBH mass and halo mass is a focus of research. In this talk, we propose a mechanism for the coevolution of black holes and their host dark matter haloes based on the hydrodynamics of accretion flow. We find that the massive haloes above a transition halo mass will be able to grow black holes to achieve a constant ratio between the hole and halo mass that agrees with the proposed black-hole and halo mass relation. Haloes below the transition halo mass would host black holes smaller than expected from the black-hole mass halo mass relation. We also compare our results with observations and find a good agreement.

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