

Relativistic Jet Simulations and Modeling on Horizon Scale

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Relativistic jets are launched in the vicinity of the central black holes and emit powerful radiation across the electromagnetic spectrum. According to our current understanding, relativistic jets are launched by directly tapping the rotational energy of spinning black holes via the so-called Blandford-Znajek process. In addition to the spin of the black hole, numerical simulations showed the amount of accreted magnetized flux has a major impact on the formation of relativistic jets. We have investigated the radiative signatures of self-consistently launched relativistic jets using 3D general relativistic magneto-hydrodynamical simulations and general relativistic radiative transfer calculations in horizon scale to the connection with large-scale structure. We discuss our findings and comparison with observations.

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