

# Acceleration and plunge near a rotating black hole

*Tuesday, 6 May 2025 15:15 (15 minutes)*

We explore off-equatorial acceleration of electrically charged matter near a magnetized black hole with the aim of understanding the boundaries between the regions of stable, plunging, and escaping motion. As a generalisation of the Innermost Stable Circular Orbit (ISCO), the concept of the radius of the Innermost Stable Spherical Orbit (ISSO) determines the inner rim of inclined accretion/ejection process. We demonstrate that the region of bound orbits has a complicated structure due to enhanced precession in strong gravity. We also explore the fate of particles launched in the near-horizon region: these may either plunge into the event horizon or accelerate to very high energy towards radial infinity (cf. The Astrophysical Journal, Volume 966, id.226, 2024; <https://arxiv.org/abs/2404.04501>).

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