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Convergence of high resolution Black Hole accretion simulations of Magnetically Arrested Disks

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Accretion is a fundamental astrophysical process, occurring across all scales of black hole mass. Despite its ubiquitous nature, the accretion process, alongside its connection to jet outflows, poses many fundamental questions. General Relativistic Magneto hydrodynamic (GRMHD) simulations are providing significant insights into the nature of black hole accretion and jet outflows. Following recent efforts in the Event Horizon Telescope (EHT) collaboration to compare numerical solutions between different GRMHD codes, we now aim to perform a convergence study between five simulations conducted using the GPU-accelerated GRMHD code H-AMR, up to a resolution of $5375 \times 2304 \times 2304$ in a logarithmic spherical-polar grid. The objective of this analysis is to assess the influence of numerical resolution on the global characteristics of simulations across a broad range of resolutions. The goal is to determine the level of agreement between simulations, examine the alteration in the disk and jet evolution, and determine the consistency of the overall results across all resolutions considered.

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