# **Outflows from Shocked Accretion Disks around Black Holes**

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We investigate transonic shocked accretion flows around a non-rotating supermassive black hole using multidimensional hydrodynamic simulations with radiative cooling. Our primary objective is to examine whether such shocked accretion disks can launch sustained, collimated bipolar outflows that extend to thousands of gravitational

radii, and to determine their terminal velocities. We perform simulations of geometrically thick accretion flows with varying specific angular momentum on a vertically elongated cylindrical domain. The results demonstrate that bipolar outflows are launched from the innermost region close to the black hole and propagate out to distances of ≈ 2500 Schwarzschild radii. The outflows attain terminal velocities whose maximum values depend on the angular momentum of the inflowing matter. To quantify the energetics and stability of these flows, we analyze the Bernoulli parameter across five angular momentum cases, track the temporal evolution of shock locations averaged over the radial extent, compute the total volume-integrated emission over time, and evaluate the mass outflow to inflow ratio M_out/ M_in. These results provide insights into the role of shocked accretion in driving large-scale outflows and the dependence of their efficiency on angular momentum.