Abstract for an Invited Paper
for the APR07 Meeting of
The American Physical Society

General Relativistic Magnetohydrodynamic Simulations of Black Hole Accretion Disks and Jets

JOHN F. HAWLEY, University of Virginia

Observations are providing increasingly detailed quantitative information about the accretion flows that power such high energy systems as X-ray binaries and Active Galactic Nuclei. These observations have been modeled in some detail by a variety of accretion scenarios, but such models rely on unavoidable assumptions such as regular flow geometry and a simple, parameterized stress. Global numerical simulations offer a way to investigate the basic physical dynamics of accretion flows without these assumptions. We have developed a fully three-dimensional general relativistic magnetohydrodynamic simulation code that evolves time-dependent inflows into Kerr black holes. The results from recent global simulations of black hole accretion disks will be reviewed, with an emphasis on the influence of the rotating hole on the disk and on jet production.