
Numerical Relativity in Axisymmetry

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Abstract

Numerical relativity, the branch of general relativity that uses simulations to solve the Einstein equations, has proven an invaluable tool in studying gravity, from gravitational wave astronomy to foundational questions such as cosmic censorship and space-time stability studies. Most current numerical relativity codes use Cartesian or spherical coordinates, which are not ideally suited to many systems that present structure around an axis, examples of which are black hole head-on collisions and critical collapse around an axis. In this talk, I present the new code I have created to do numerical relativity simulations with a free choice of spatial coordinates, and present results and simulations in both cylindrical and spherical coordinates.

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