

Abstract for an Invited Paper
for the APR06 Meeting of
The American Physical Society

Numerical simulations of generic singularities

DAVID GARFINKLE, Oakland University

Numerical simulations are performed of the approach to the singularity of spacetimes with no symmetries. In all cases the singularity is spacelike, and as it is approached, it is local in the sense that the terms in Einstein's equation with spatial derivatives become unimportant compared to those with time derivatives. The dynamics thus becomes locally that of a homogeneous spacetime, though a different homogeneous spacetime for each spatial point. In the case of a scalar field, these homogeneous spacetimes are of the Kasner type with power law behavior of the scale factors. In the vacuum case, the homogeneous spacetimes are Mixmaster type, with oscillatory behavior.