Abstract Submitted
for the APR05 Meeting of
The American Physical Society

Dynamical evolution of quasi-circular binary black hole data PETER DIENER, Center for Computation and Technology, Louisiana State Univ., MIGUEL ALCUBIERRE, Inst. de Ciencias Nucleares, Univ. Nacional Autonoma de Mexico, BERND BRUEGMANN, Friedrich-Schiller Univ. Jena, IAN HAWKE, School of Mathematics, Univ. of Southampton, SCOTT HAWLEY, Center for Relativity, Univ. of Texas at Austin, FRANK HERRMANN, Max-Planck-Inst. fuer Gravitationsphysik, Albert-Einstein-Institut, MICHAEL KOPPITZ, Laboratory for High Energy Astrophysics, NASA Goddard Space Flight Center, DENIS POLLNEY, Max-Planck-Inst. fuer Gravitationsphysik, Albert-Einstein-Institut, EDWARD SEIDEL, Center for Computation and Technology, Louisiana State Univ., JONATHAN THORNBURG, Max-Planck-Inst. fuer Gravitationsphysik, Albert-Einstein-Institut, AEI - LSU NUMERICAL RELATIVITY GROUP COOPERATION COLLABORATION — We present fully nonlinear dynamical evolutions of binary black hole data, whose orbital parameters are specified via the effective potential method for determining quasi-circular orbits. The cases studied range from the Cook-Baumgarte innermost stable circular orbit (ISCO) to significantly beyond that separation. In all cases we find the black holes to coalesce (as determined by the appearance of a common apparent horizon) in less than half an orbital period, indicating that the holes are not in quasi-circular orbits but are in fact nearly plunging together. We have studied the dynamics of the final black hole and determined its physical parameters, such as spin, mass and oscillation frequency.

Peter Diener
Center for Computation and Technology, Louisiana State University

Date submitted: 14 Jan 2005 Electronic form version 1.4