

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

**Status of Initial Data for Binary Black Hole Collisions**

GREGORY COOK, Wake Forest University

The first initial data for black-hole binaries were derived from analytic time-symmetric multi-hole solutions of Misner and Lindquist in the early 1960s. These served as a test-bed for all of the pioneering efforts to evolve black-hole binaries to collision. The first major revolution in this field was introduced by Bowen and York in 1980, allowed for time-asymmetric data representing boosted and spinning holes, and required the numerical solution of a single scalar boundary-value problem. Initial-data methods based on the Bowen-York extrinsic curvature were developed and explored over the last 25 years and initial data based on these methods are still widely used for black-hole binary evolutions. However, in the past 5 years, a second major revolution has taken place that promises to yield initial data that is much more astrophysically realistic. These new initial-data sets are more computationally expensive to construct and their full physical content is still being explored. In this talk, we will look at this new method for constructing black-hole binary initial data, see what it does well, and where it needs further improvement.