Abstract Submitted
for the APR11 Meeting of
The American Physical Society

Adaptive Mesh Refinement in the Context of Spectral Numerical Evolutions of Binary Black Hole Space-Times[1] BELA SZILAGYI, Caltech — Spectral numerical methods are known for giving faster convergence than finite difference methods, when evolving smooth quantities. In binary black hole simulations of the SpEC code this exponential convergence is clearly visible. However, the same exponential dependence of the numerical error on the grid-resolution will also mean that a linear order mismatch between the grid-structure and the actual data will lead to exponential loss of accuracy. In my talk I will show the way the Caltech-Cornell-CITA code deals with this, by use of what we call Spectral AMR. In our algorithm we monitor truncation error estimates in various regions of the grid as the simulation proceeds, and adjust the grid as necessary.

[1]Supported by Sherman Fairchild Foundation and NSF grants PHY-061459 and PHY-0652995 to Caltech.

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Date submitted: 14 Jan 2011 Electronic form version 1.4