Abstract Submitted
for the APR11 Meeting of
The American Physical Society

Relative stability of black hole threshold solutions in critical gravitational collapse THEODOR BRASOVEANU, FRANS PRETORIUS, Princeton University — We present numerical studies of the relative stability of Type I critical solutions in problems of gravitational collapse. These strong-field, non-trivially dynamic solutions to Einstein equations, initially discovered by M. Choptuik, arise at the threshold of black hole formation. We study the interaction between two different matter models in spherical symmetry (a boson star and a perturbing SU(2) Yang-Mills field) that exhibit the same type of threshold solution. Given the unstable nature of the critical solutions, the central question that we address is how does matter of one type behave in the presence of a critical solution of another type of matter. This question was investigated by Choptuik in the case of Type II collapsing systems, where the scalar field was found to dominate the dynamics of the combined system. Hereby we present results for Type I collapse, using adaptive grid techniques to solve Einstein equations coupled to matter.

Theodor Brasoveanu
Princeton University

Date submitted: 14 Jan 2011 Electronic form version 1.4