

Abstract Submitted
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Finite Elements in Numerical Relativity MATTHEW ANDERSON,
Louisiana State University — We employ finite elements in solving the Einstein equations for black hole spacetimes. Numerical simulation of black hole spacetimes requires special treatment for the singularity inside a black hole. One common approach is to excise the singularity from the computational domain. Recent analysis has emphasized the importance of using smooth excision regions to achieve stable black hole evolutions. Smooth excision regions can be produced easily using unstructured meshes. Solving the Einstein equations requires solving equations of two types: the elliptic initial data (constraint) equations and evolution equations. We present examples of solving both types of equations for both black hole and black string spacetimes using the finite element method.

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