Numerical Methods for Solving the Einstein-Maxwell Equations in Symmetric Spacetimes CHRIS VERHAAREN, Brigham Young University — We present a method for solving the Einstein-Maxwell equations of general relativity in spacetimes with symmetries. Our example spacetime is a 4+1 dimensional spacetime which has one time symmetry and two independent angular symmetries. We show that the five dimensional Einstein-Maxwell equations can be transformed into a set of elliptic partial differential equations in two variables for six scaler fields coupled to the two dimensional Einstein-Maxwell equations. Using a self-consistent field approach, this becomes a numerically solvable problem. We present our numerical solutions for special cases and compare with known solutions.

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