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Aghil Alae* (aak818@mun.ca), Mathematics and Statistics Department, Memorial University of Newfoundland, St. John's, NL A1C 5S7, Canada. *Mass Functionals for Initial Data with Symmetries.*

Consider a broad class of asymptotically flat, maximal slices satisfying the constraint vacuum Einstein equations admitting two commuting rotational symmetries. We construct a ‘mass’ functional for ‘t-phi’ symmetric data which agrees with the ADM mass and show that when restricted to stationary, axisymmetric data, this functional has the same critical points as Carter’s positive definite action for the stationary vacuum Einstein equations with the above spatial isometry group. The construction is a natural extension of S. Dain’s mass functional for three-dimensional initial data sets. However, the proposed generalization is not manifestly positive definite. (Received August 18, 2014)