QUASI-LOCAL MASS AND THE STATIC EXTENSION PROBLEM IN GENERAL RELATIVITY

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Abstract: There are several competing definitions of quasi-local mass in General Relativity. A very promising and natural candidate, proposed by R. Bartnik, seeks to localize the total or ADM mass. Fundamental to understanding Bartnik's construction is the question of existence and uniqueness for a canonical geometric boundary value problem associated with the static vacuum Einstein equations. In this talk we will report on joint work with M. Anderson, which confirms that existence holds (under a nondegeneracy condition) but also shows that uniqueness fails. The possible implications of this result will be discussed.