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Noah Benjamin and **Iva Stavrov Allen*** (istavrov@clark.edu), 0615 SW Palatine Hill Road, MSC 110, Portland, OR 97219. *The effects of self-interaction on constructing relativistic point particles.*

We introduce a framework for studying the effects of self-interaction on the construction of point particle initial data in General Relativity. Within this framework we rigorously prove the claim of Arnowitt, Deser and Misner that electrically neutral point source modeled by a Dirac delta distribution must have zero ADM mass. We further identify a geometric structure and a scaling parameter that allow one to determine, by controlling the effects of self-interaction, when a sequence of "collapsing" matter distributions yields non-zero mass in the limit. (Received September 26, 2017)