1056-83-921 **Arick Shao*** (aricks@math.princeton.edu). *Breakdown Criteria for Nonvacuum Einstein Equations.*

We generalize a recent "breakdown criterion" result of S. Klainerman and I. Rodnianski to nonvacuum spacetimes. This breakdown result states roughly that an Einstein vacuum spacetime, given as a constant mean curvature foliation, can be extended if the second fundamental form and the derivative of the lapse of the foliation are uniformly bounded. We adapt this theorem and its proof to Einstein-scalar and Einstein-Maxwell spacetimes. In particular, we deal with a multitude of difficulties resulting from nontrivial Ricci curvature and from the coupling between the Einstein and the field equations. Furthermore, the results we prove can be directly extended to Einstein-Klein-Gordon and Einstein-Yang-Mills spacetimes. (Received September 18, 2009)