

BREAKDOWN CRITERIA OF EINSTEIN EQUATIONS IN CMC  
GAUGE

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I will report my work [1, 2] on the geometric criterion for the breakdown of Einstein vacuum space-times with the constant mean curvature (CMC) foliation. In this work, the criterion is formulated in terms of time-integrability of the sup-norms of the second fundamental form and derivatives of the lapse function associated to CMC foliation of the space-time. This result is obtained through deriving uniform lower bound on the null radius of injectivity of the light cones.

*Keywords:* Einstein Equations, null radius of injectivity

- [1] Improved breakdown criterion for Einstein vacuum equation in CMC gauge, *Comm. Pure Appl. Math*, Vol. LXV, 0021-0076 (2012)
- [2] On Ricci coefficients of null hypersurfaces with time foliation in Einstein vacuum space-time: Part I, *Accepted by Calculus of variations and PDE*. (arXiv:1006.5963)