

Cauchy Data of Vacuum Einstein Equations Evolving to Black Holes

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Abstract:

We show the existence of complete, asymptotically flat Cauchy initial data for the vacuum Einstein field equations, free of trapped surfaces, whose future development must admit a trapped surface. Moreover, the datum is exactly a constant time slice in Minkowski space-time inside and exactly a constant time slice in Kerr space-time outside. The proof makes use of the full strength of Christodoulou's work on the dynamical formation of black holes and Corvino-Schoen's work on the constructions of initial data set.