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On the instability of the Riemannian Penrose inequality in higher dimensions

Mantoulidis and Schoen constructed 3-dimensional asymptotically flat initial data sets with prescribed horizon boundary, whose mass can be made arbitrarily close to the optimal value in the Riemannian Penrose inequality, while the geometry of the horizon is far from being rotationally symmetric. In this talk we will describe an adaptation of this construction that leads to higher dimensional black hole initial data sets with analogous properties. This talk is based on joint work with Pengzi Miao.