

Abstract

Rapidly rotating asymptotically flat black holes in higher dimensions can be unstable to gravitational perturbations, not necessarily of the Gregory-Laflamme type. By evolving these instabilities into the fully non-linear regime using numerical relativity, we find that these black holes develop structures that should be locally Gregory-Laflamme unstable and hence pinch off in finite asymptotic time, giving rise to naked singularities. Since these instabilities are generic, they therefore constitute potential counter-examples to the weak cosmic censorship conjecture in higher dimensional asymptotically flat space. These results provide a general picture of the stability/instability properties of black holes in higher dimensions.