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Strong cosmic censorship conjecture for a charged BTZ black hole

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The strong cosmic censorship conjecture, whose validation asserts the deterministic nature of general relativity, has been studied for charged BTZ black holes in three-dimensional general relativity, as well as for N th-order pure Lovelock gravity in $d=2N+1$ spacetime dimensions. Through both analytical and numerical routes, we have computed the ratio of the imaginary part of the quasi-normal mode frequencies with the surface gravity at the Cauchy horizon. The lowest of which corresponds to the key parameter associated with the violation of strong cosmic censorship conjecture. Our results demonstrate that this parameter is always less than the critical value $(1/2)$, thereby respecting the strong cosmic censorship conjecture. This is in complete contrast to the four or, higher-dimensional black holes, as well as for rotating BTZ black holes, where the violation of strong cosmic censorship conjecture exists.

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