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Title: Asymptotically flat hairy black holes in Massive Bigravity

Abstract: We study asymptotically flat black holes with massive graviton hair within the ghost-free Bigravity theory. There have been contradictory statements in the literature about their existence: such solutions were reported some time ago, but later a different group claimed the Schwarzschild solution to be the only asymptotically flat black hole in the theory. We have analyzed the issue ourselves and have been able to construct such hairy black holes within a carefully designed numerical scheme. We analyze their perturbative stability and find that some of them can be stable, depending on the theory parameters values. The masses of such stable hairy black holes range from stellar values up to values typical for supermassive black holes. One of their two metrics is extremely close to Schwarzschild, while all their ""hair"" is hidden in the second metric that is not coupled to matter and not directly seen. If the Massive Bigravity theory indeed describes physics, the hair of such black holes should manifest themselves in violent processes only, like black hole mergers, and should be visible in the structure of the signals detected by LIGO/VIRGO.