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Asymptotically flat hairy black holes in massive bigravity

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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, but we have been able to construct such solutions within a carefully designed numerical scheme. The masses of stable hairy black holes that would be physically relevant range from stellar values up to values typical for supermassive black holes. One of their two metrics is extremely close to Schwarzschild while all the “hair” is hidden in the second metric that is not coupled to matter and not directly seen. However, the “hairy features” should manifest themselves in violent processes like black hole collisions and should be visible in the structure of the signals detected by LIGO/VIRGO.

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