

Gravitational waves from self-interacting axion clouds around rotating black holes

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Black hole superradiance can lead to the formation of clouds of ultralight bosons such as axions. These clouds are expected to be detected through gravitational wave observations, but reliable predictions require a detailed understanding of their evolution. We investigate the dynamics of axion clouds including the effects of self-interaction, with particular emphasis on the role of mode couplings with multiple levels. We present the resulting phenomena and discuss their potential impact on gravitational wave signals.

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