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The influence of the acceleration produced by the third celestial body on black hole binaries

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Ground-based gravitational wave detectors have observed dozens of binary black holes. Some of them may have formed in dynamic environments, such as globular clusters or active galactic nuclei (AGN) disks. In this case, third-body interactions with (super-)massive, and possibly intermediate mass BHs will imprint clear signatures on observed GW signals due in particular to the gravitational pull of the more massive BH. As a preliminary attempt, we estimate the parameters of the massive binary black hole signal affected by acceleration based on LISA-beta, study the detectable minimum acceleration, and investigate the influence of acceleration on other parameters.

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