

TEST OF A GENERAL FORMULA FOR BLACK HOLE GRAVITATIONAL WAVE KICKS

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Although the gravitational wave kick velocity in the orbital plane of coalescing black holes has been understood for some time, apparently conflicting formulae have been proposed for the dominant out-of-plane kick, each a good fit to different data sets. This is important to resolve because it is only the out-of-plane kicks that can reach more than 500 km s⁻¹ and can thus eject merged remnants from galaxies. Using a different ansatz for the out-of-plane kick, we show that we can fit almost all existing data to better than 5%. This is good enough for any astrophysical calculation and shows that the previous apparent conflict was only because the two data sets explored different aspects of the kick parameter space.

Published in The Astrophysical Journal 719 p 1427 (2010)

Though it was originally submitted as:

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(Submitted on 19 Mar 2010)

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