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# Cross-correlation of the astrophysical gravitational-wave background with galaxy clustering

*Tuesday 12 November 2019 12:00 (15 minutes)*

We investigate the correlation between the distribution of galaxies and the predicted gravitational-wave background of astrophysical origin. We show that the large angular scale anisotropies of this background are dominated by nearby non-linear structure, which depends on the notoriously hard to model galaxy power spectrum at small scales. In contrast, we report that the cross-correlation of this signal with galaxy catalogues depends only on linear scales and can be used to constrain the average contribution to the gravitational-wave background as a function of time. Using mock data based on a simplified model, we explore the effects of galaxy bias and the matter abundance on these constraints. Our results suggest that the gravitational-wave background when combined with near-future galaxy surveys, is a powerful probe for both gravitational-wave merger physics and cosmology.

Reference: https://arxiv.org/abs/1910.08353

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**Session Classification:** Short talks