

Whispers from the Dark Universe - Particles & Fields in the Gravitational Wave Era

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WHISPERS FROM THE DARK UNIVERSE – PARTICLES & FIELDS IN THE GRAVITATIONAL WAVE ERA

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The impact of cosmic variance on PTAs anisotropy searches

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After the North American Nanohertz Observatory for Gravitational Waves (NANOGrav) reported evidence of an isotropic background of gravitational waves (GWB) at nanohertz in its 15-year data set, the next important step is to understand where this signal might come from. One way to do this is to look for the presence of anisotropies in it: this would help to distinguish an astrophysical origin, e.g. from supermassive black hole binaries (SMBHB), from a cosmological one, e.g. from a cosmological phase transition. So far, no significant evidence of anisotropy has been found. In our work, we investigated the impact that the inclusion of some previously neglected contributions in these analyses, such as cosmic variance, would have on the possibility of detecting anisotropy with PTAs in the near future.

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