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A novel probe of graviton dispersion relations at nano-Hertz frequencies

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We generalise Phinney's 'practical theorem' to account for modified graviton dispersion relations motivated by certain cosmological scenarios. Focusing on specific examples, we show how such modifications can induce characteristic localised distortions, bumps, in the frequency profile of the stochastic gravitational wave background emitted from distant binary sources. We concentrate on gravitational waves at nano-Hertz frequencies probed by pulsar timing arrays, and we forecast the capabilities of future experiments to accurately probe parameters controlling modified dispersion relations.

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Session Classification: Dark Matter and Gravitational Observables