

Non-Gaussian gravitational waves from inflation

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It has been widely assumed that detection of primordial gravitational waves from inflation in, for example, B-mode polarisation of the cosmic microwave background, immediately implies discovery of the quantum nature of spacetime. While this statement is true for the vacuum solution, it does not apply if the gravitational waves originate from the matter fields. How can we distinguish between these two origins? The answer is non-Gaussianity. We show that the gravitational waves from SU(2) gauge fields coupled to a spectator axion field during inflation are highly non-Gaussian with a characteristic shape, whereas those from the vacuum are only weakly non-Gaussian.

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