

QUANTUM INFORMATIC SYMMETRY OF QUASI-DE SITTER BACKGROUNDS

SEMINAR

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PAMU SEMINAR ROOM

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Abstract

We investigate how degeneracies in quasi-de Sitter backgrounds, in the sense of Wands' duality, are reflected in real-space quantum correlations of primordial perturbations. Using the continuous-variable Gaussian formalism for coarse-grained scalar fluctuations, I will show how to construct the covariance matrix of a pair of spatially localized modes in inflationary spacetime, and extract the symplectic invariants of the system. For a generic Wands-dual pair of backgrounds, we will find that while the individual entries of the covariance matrix are highly background-dependent, the symplectic eigenvalues – and hence the entanglement entropy, mutual information, quantum discord and log-negativity – all coincide for the two dual realizations. Our results unveil a new “*quantum-informatic symmetry*” of the de Sitter vacuum, according to which local linear entanglement witnesses constructed from coarse-grained fields cannot distinguish between Wands-dual inflationary histories, even though their background trajectories differ. I will show that the special nature of the Wands-duality symmetry (of being local, scale-independent canonical transformations) is at the heart of this duality.

Everyone is invited to attend