

Abstract Submitted
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Relativistic Quantum Communication and the Structure of Spacetime EDUARDO MARTIN-MARTINEZ, University of Waterloo and Perimeter Institute — We study the transmission of information and correlations through quantum fields in cosmological backgrounds. With this aim, we make use of quantum information tools to quantify the classical and quantum correlations induced by a quantum massless scalar field in two particle detectors, one located in the early universe (Alice's) and the other located at a later time (Bob's). In particular, we focus on two phenomena: a) the consequences on the transmission of information of the violations of the strong Huygens principle for quantum fields, and b) the analysis of the field vacuum correlations via correlation harvesting from Alice to Bob. We will study a standard cosmological model first and then assess whether these results also hold if we use other than the general relativistic dynamics. As a particular example, we will study the transmission of information through the Big Bounce, that replaces the Big Bang, in the effective dynamics of Loop Quantum Cosmology. We show that much more information reaches us through timelike channels (not mediated by real photons) than it is carried by rays of light, which are usually regarded as the only carriers of information.

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