

Abstract Submitted
for the APR20 Meeting of
The American Physical Society

Averaged null energy condition and eternal inflation ELENI-ALEXANDRA KONTOU, College of the Holy Cross, KEN OLUM, Tufts University — Fluctuations in the scalar field driving inflation can lead to an increase in the expansion rate, decreasing the Hubble distance. A converging shell of geodesics just inside the old Hubble distance will be outside the new one and thus be carried away by the Hubble flow. This implies defocusing, which requires violation of the Averaged Null Energy Condition (ANEC). However, semiclassical proofs of ANEC suggest that such violations should not exist. In this talk I will argue that this paradox arises from considering the entire quantum state at early times but only a specific quantum state at late times. Examining a late-times fast expanding state and tracing back its evolution, I show how ANEC is in fact obeyed in an eternally inflating spacetime.

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Date submitted: 10 Jan 2020

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