Abstract Submitted
for the APR18 Meeting of
The American Physical Society

Inflation from vacuum pairs ALLAN ROSENCWAIG, Aris Labs — We propose that a scalar quantum field representing the latent heat of separation of the strong force first-order phase transition is present in the supercooled phase of that transition. The vacuum particle pairs associated with this scalar quantum field may account for cosmological inflation. We show that this vacuum pair model provides an inflation of about 60 e-folds with a duration of about 10^{-32} s. The model also provides mechanisms for ending inflation, for reheating and for the generation of cosmic-scale spatial density variations. It predicts a CMB spectrum with a spectral index $n_s = 0.966$, in excellent agreement with CMB data, and a tensor-to-scalar ratio r of about 10^{-4}, well below the Planck lower limit of 0.1. Most importantly, unlike current models, the vacuum pair model has only one adjustable parameter and requires no fine-tuning or special initial conditions. Furthermore, the vacuum pair model does not predict eternal inflation or a multiverse.

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Date submitted: 09 Nov 2017 Electronic form version 1.4