Abstract Submitted
for the APR20 Meeting of
The American Physical Society

A Standard Model Mechanism for Dark Energy Based on Hubble Length Frozen Fermions. ROBERT HAYES, North Carolina State University, RETROSPECTIVE DOSIMETRY AND NUCLEAR ASSAY TEAM — Universal expansion forces all space apart at such a rate that any information on one end of a Hubble length can never reach the other. Any fermion having a wavelength scaling with the Hubble length is then effectively frozen in place as one side can never reach the other. In other words, a trough can never reach a crest such that all ultra-low energy fermions are then forced to be stationary. Being fermions, their antisymmetric wave functions give rise to the Pauli exclusion principle so that any portion of overlapping wave functions which might otherwise be indistinguishable would then push each other to perturb any changeable quantum number to allow conservation of fermion number. This can be described as a minimal orthogonal overlap condition but for identical fermions, the obvious properties which can be changed while obeying all conservation laws becomes that of energy and/or position. The small and limited push from one frozen fermion on another due to the Pauli exclusion principle then serves as a force from one to the other. With these fermions being coupled to the Hubble length, it is assumed that just as the Hubble length can pull on these fermions, they can in turn push on the same giving rise to a universal expansion property effectively being a dark energy force. Reference; Hayes RB. (2017) A standard model approach to dark energy and inflation. J. Cosmology 26, pp 14850-14859..

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Date submitted: 14 Jan 2020 Electronic form version 1.4