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Ultra-low energy Fermions as a contributor to dark energy[1] ROBERT HAYES, North Carolina State University, RDNA TEAM — When any ultra-low energy particle has a wavelength comparable to or greater than the Hubble length, the space between that particles ends overlapping the Hubble length expand at the speed of light and so effectively freeze the particle in place (its trough can never reach the location of its crest). Any such particles are then effectively coupled to the horizon in that they are forced to stretch with the same (tentatively including primordial particles, Hayes 2017). All such particles so coupled to the Hubble length which happen to be Fermions are then also subject to the Pauli exclusion principle (PEP). The antisymmetric nature of any such ultralow energy fermions when coupled to the Hubble length requires them to take distinct quantum numbers including that of spatial location. Any overlap then will result in a force similar to the very familiar terrestrial force of PEP between touching materials to prevent valence electron overlap. This provides a predictable standard model mechanism for large scale cosmological expansion beyond the initial big bang inflationary kinetic energy if the coupling to the Hubble length does not just pull on the Fermions but can also be pushed on by the same. Reference; Hayes RB. (2017) A standard model approach to dark energy and inflation. J. Cosmology 26, pp 14850-14859.

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