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Growing neutrino dark energy

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The “growing neutrino scenario” solves the coincidence problem of dark energy by a growing cosmological value of the neutrino mass which emerges from an interaction between a scalar field and the neutrino. The field mediated attraction between neutrinos induces the formation of large scale neutrino lumps in a recent cosmological epoch. I will show that the non-linearities in the scalar field equation of motion stop the further increase of the neutrino mass when sufficiently dense and large lumps are formed. Consequently, the neutrino induced gravitational potential is substantially reduced when compared to linear estimates. I will also demonstrate that inside a lump, the possible time variation of fundamental constants is much smaller than their cosmological evolution. This feature may reconcile current geophysical bounds with claimed cosmological variations of the fine structure constant.

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