

Abstract

An interesting dynamical model for dark energy which does not require extremely light scalar fields such as quintessence, and at the same time explains the (near-) coincidence between the neutrino and dark energy densities is the model of dark energy coupled to mass varying neutrinos (MaVaNs). Despite the attractions of this model, I show that, generically, this model contains a catastrophic instability which occurs when neutrinos become non-relativistic. As a result of this instability, as neutrinos become non-relativistic, they condense into neutrino nuggets which redshift away similar to cold dark matter, and thus cease to act as dark energy. Any stable MaVaNs dark energy model is extremely contrived, and is virtually indistinguishable from a cosmological constant.