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Cosmological relaxation of the electroweak scale

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Recently, a new mechanism to generate a naturally small electroweak scale has been proposed, the so-called “relaxion”. It exploits the coupling of the Higgs to an axion-like field and a long era in the early universe where the axion unchains a dynamical screening of the Higgs mass. We present a new realization of this idea with the new feature that it leaves no signs of new physics up to a rather large scale, 10^9 GeV, except for two very light and weakly coupled axion-like states. One of these scalars can be a viable Dark Matter candidate. Such a cosmological Higgs-axion interplay could be tested with a number of experimental strategies.

Author: Prof. ESPINOSA, Jose Ramon (ICREA/IFAE)

Orateur: Prof. ESPINOSA, Jose Ramon (ICREA/IFAE)

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