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# Cosmological Relaxation through the Dark Axion Portal

*Wednesday, January 26, 2022 11:00 AM (1 hour)*

The dark axion portal is a coupling of an axion-like particle to a dark photon kinetically mixed with the visible photon. I will demonstrate how this portal, when applied to the relaxion, can lead to cosmological relaxation of the weak scale using dark photon production. The key backreaction mechanism which triggers the trapping of the Higgs vev at the desired value involves the Schwinger effect: As long as electroweak symmetry is unbroken, Schwinger production of massless Standard Model fermions, which carry dark millicharges, suppresses the dark photon production. Once the electroweak symmetry is broken, the fermions acquire mass and the suppression is lifted. An enhanced dark photon dissipation then traps the relaxion at a naturally small weak scale. This model thus provides a novel link between the phenomenological dark axion portal, dark photons, and the hierarchy problem of the Higgs mass.

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