

Phenomenology 2022 Symposium: From Virtual to Real



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Altered Axion Abundance from a Dynamical Peccei-Quinn Scale

Monday 9 May 2022 15:15 (15 minutes)

I will discuss a model in which the relic abundance of axions is altered from the standard misalignment mechanism, either increased or decreased, due to the presence of a new light scalar that couples to the radial part of the Peccei-Quinn (PQ) field. The light scalar makes the effective PQ symmetry-breaking scale dynamical, altering the early-time dynamics for the axion and affecting its late-time dark matter abundance. I will present a semi-analytical analysis and a numerical analysis of this new mechanism, showing that it can accommodate both lighter or heavier axion dark matter, compared to the standard treatments. I will briefly comment on the implications of the model for axion searches and fundamental physics. This talk is based on the work in 2203.15817.

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