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Gravitational Waves from Dimension-6 Assisted Peccei - Quinn Phase Transitions

Tuesday, 1 December 2026 14:00 (30 minutes)

We discuss a simple model-independent extension of the minimal KSVZ axion model, augmenting the Peccei - Quinn effective potential with a dimension-6 operator invariant under the Peccei - Quinn symmetry. We show that this operator can trigger a first-order phase transition and describe the following cosmological consequences. We map out the parameter space, consistent with present observational constraints, in which the phase transition produces a gravitational wave signal observable at current and future interferometers, and we elaborate on the resulting dark matter phenomenology. Finally, we present specific ultraviolet completions that generate the dimension-6 operator, each leading to distinct phenomenological signatures, which motivates our model-independent approach.

Academic position of the presenting author

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