Schwinger-Like Production of Axion String Loops

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Abstract

Axion strings appear naturally in many axion models, and their dynamics can play a role in axion cosmology. One way of producing axion strings is through a Schwinger pair production like process. In ordinary Schwinger pair production, a background electric field can produce charged particle-antiparticle pairs, such as electron-positron pairs. The analogous question for axions is whether a background field can create extended objects: instead of producing particle worldlines, the process produces axion string worldsheets. In this talk I will describe this non-perturbative calculation to extract the rate of axion string production and discuss its connection to cosmology.

Keywords: Axion string, Nonperturbative effects, Axion cosmology, Topological defect

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