

Abstract Submitted
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Resurgence and the Schwinger Effect¹ ZACHARY HARRIS, GERALD DUNNE, University of Connecticut — Describing quantum systems in the presence of extreme electromagnetic fields is a very hard problem, one which defines the frontiers of many areas of research from astrophysics to non-linear optics. In this talk, I will explore the strong magnetic field regime and the complementary strong electric field regime for the Schwinger effect: the creation of particle-antiparticle pairs from vacuum. One of our best tools for solving hard problems is perturbation theory, but many of the phenomena of interest in systems with strong fields or interactions are non-perturbative. Moreover, even in systems of weak fields, perturbative expansions are generically divergent. Though it seems perturbation theory is completely inapplicable to these problems, it turns out that the divergence of the weak field expansions is deeply connected to the appearance of non-perturbative phenomena. These ideas can be used to construct remarkably accurate new extrapolations from the weak field to the strong field regime.

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