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Charge fluctuations in SQED in power-law inflation

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The rapid expansion of inflationary universe amplifies microscopic linear quantum fluctuations of non-conformally coupled fields such as the minimally coupled massless scalar, and generates large superhorizon correlators. On the other hand, conformally coupled fields such as the photon are insensitive to the expansion itself. However, if the photon couples to the complex scalar the effect of the rapid expansion can be mediated to the photon: Expansion induces large superhorizon correlators of charge currents of the scalar, which in turn induce correlators of electric and magnetic fields much larger than their tree level values. I will present recent results in scalar electrodynamics in power-law inflation.

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Session Classification: dark matter