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More Axions from Strings

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The axion solution to the strong CP problem also provides a natural dark matter candidate. If the PQ symmetry has ever been restored after inflation, topological defects of the axion field would have formed and produced relic axions, whose abundance is in principle calculable. We study the contribution to the abundance produced by string defects during the so-called scaling regime. Clear evidence of scaling violations is found, the most conservative extrapolation of which strongly suggests a large number of axions from strings. The overall result is a lower bound on the QCD axion mass in the post-inflationary scenario that is substantially stronger than the naive one from misalignment.

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