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The dark-matter axion mass

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The QCD axion solves the QCD theta problem and is a possible dark matter candidate. Axion production in the early Universe is complicated because the axion field develops cosmic strings. The string dynamics is sensitive to the tension, which cannot be reproduced correctly in conventional classical-field simulations. We introduce a new approach to solve this problem without an exponentially large lattice by using an effective theory. Our results for the axion mass, if it makes up all of the dark matter, is $m_a = 26.2 \pm 3.4 \mu\text{eV}$.

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