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## Axion dark matter and inflation scale

*Wednesday, 29 September 2021 11:55 (15 minutes)*

I show that the upper bound of the classical QCD axion window can be significantly relaxed with (not too) low-scale inflation. If the Gibbons-Hawking temperature during inflation is lower than the QCD scale and the inflation lasts long enough, the initial QCD axion misalignment angle follows the Bunch-Davies distribution. The distribution is peaked at the strong CP conserving minimum if there is no other light degree of freedom contributing to the strong CP phase. As a result, the axion can be the dark matter even for the mass much lighter than  $\mu\text{eV}$ . I also discuss some applications of the mechanism.

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