



Contribution ID: 240

Type: **not specified**

Heavy QCD axion inflation and strong CP problem

Friday 27 August 2021 13:50 (20 minutes)

The QCD axion mass may receive contributions from small-size instantons or other Peccei-Quinn breaking effects. I show that it is possible for such a heavy QCD axion to induce slow-roll inflation if the potential is sufficiently flat near its maximum by balancing the small instanton contribution with another Peccei-Quinn symmetry breaking term. In addition, requiring the axion hilltop inflation may result in the strong CP phase that is close to zero.

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Session Classification: Axion Physics and Experiments

Track Classification: Axion Physics and Experiments