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Hybrid inflation driven by QCD axion

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Inflation plays a central role in modern cosmology. In order to reheat the Universe, inflaton must couple to the Standard Model particles, including gluons. Meanwhile, the QCD axion may couple to gluons to solve the strong CP problem. In this study, we investigate the inflationary scenario involving a QCD axion and a scalar field coupled to gluons. We find that this scenario can solve the isocurvature and quality problems associated with the QCD axion. We also discuss the possibility of QCD axion dark matter. Interestingly, the QCD axion can serve as the inflaton.

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