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# Classical Nonrelativistic Effective Field Theories for a Real Scalar Axion Field

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A nonrelativistic effective field theory for a real Lorentz-scalar axion field $\phi$ is most conveniently formulated in terms of a complex scalar axion field $\psi$. There have been several recent derivations of classical effective Lagrangians for the complex field $\psi$ in which the effective potential was determined to order $(\psi^*\psi)^3$ for specific interaction potentials $V(\phi)$. In this talk, I will show that the different effective Lagrangians agree with the first derivation of the effective Lagrangian in axion EFT where the effective potential was determined to order $(\psi^*\psi)^5$ for the most general interaction potential $V(\phi)$ with $Z_2$ symmetry.

## Summary

**Authors:**   MOHAPATRA, Abhishek (The Ohio State University);  BRAATEN, Eric (Ohio State University);  ZHANG, Hong

**Presenter:**   MOHAPATRA, Abhishek (The Ohio State University)

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