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## Quadratic Coupling of Axions to Photons

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In a recent work, using chiral perturbation theory as a guide, we showed that the QCD axion couples to the electromagnetic kinetic term at one loop.

If axions make up dark matter, they should then induce some temporal variation of the fine structure constant  $\alpha$ , which is severely constrained.

This argument can be generalised to ALPs and can lead to stringent constraints in ALP parameter space, which I will discuss.

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