

# Phenomenology of the companion-axion model

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We study the phenomenology of the ‘companion-axion model’ consisting of two coupled QCD axions. The second axion is required to rescue the Peccei-Quinn solution to the strong-CP problem from the effects of colored gravitational instantons. We investigate here the combined phenomenology of axion-axion and axionphoton interactions, recasting present and future single-axion bounds onto the companion-axion parameter space. Most remarkably, we predict that future axion searches with haloscopes and helioscopes may well discover two QCD axions, perhaps even within the same experiment

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