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Axion dark matter from fragmentation

Axion fragmentation may serve as a mechanism to produce the observed DM abundance, which makes it possible for axion DM to appear with lower values of the decay constant than those allowed by the conventional misalignment mechanism. Specifically, regions of parameter space accessible to a range of experiments may contain such viable DM candidates. Fragmentation can take place if a light scalar field, such as an ALP or QCD axion, is given an initial velocity, which can lead to parametric resonance as the field traverses the potential barriers. The setup is similar to that assumed by the Affleck–Dine mechanism or the kinetic misalignment mechanism, and fragmentation may take place instead of the latter.

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