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Search for heavy axions with the European X-Ray Free Electron Laser

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When the Peccei-Quinn symmetry breaks after inflation, domain walls will form at the QCD scale in the axion field if there is more than one quark charged under the symmetry (as in e.g. the DFSZ model). When destabilised by quantum gravity effects, the collapse of the wall network creates relativistic axions, which subsequently turn non-relativistic and contribute to cold dark matter. Accounting for this additional contribution then requires the axion to be heavier than ~ 10 meV - a mass range that is little explored experimentally. We describe first results from a new light-shining-through-walls search for such heavy axions at the EuXFEL, Hamburg.

Collaboration(s)

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