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【375】Search for axion dark matter with ultracold neutrons

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Axion-like particles are good candidates for cold dark matter. They would form a galactic-scale classical field, which on local scales undergoes coherent oscillations. Through their coupling to gluons these particles would induce oscillating electric dipole moments (EDMs) in nucleons and atoms. We analyse data of two neutron EDM experiments: ILL, Grenoble, France (1998-2002) and PSI, Villigen, Switzerland (2015-16), explicitly looking for an oscillating neutron EDM signal. Our analysis is the first direct laboratory search for the ALP-gluon coupling, with improved sensitivity over indirect bounds from cosmological observations.

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