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Low Mass Axion Searches from ABRACADABRA Results to the DMRadio Program

Saturday 1 April 2023 08:30 (15 minutes)

This talk will review the results from ABRACADABRA-10 cm, the status of the DMRadio suite of experiments including DMRadio-50L and DMRadio-m^3, and the plans for a next-generation GUT-scale-sensitive experiment, DMRadio-GUT. These experiments search for the coupling of axionic dark matter to electromagnetism at masses below 1 μeV. Axions at these lower mass ranges can naturally be produced in the measured dark matter abundance if Peccei-Quinn symmetry breaking occurs prior to inflation. A particularly well motivated mass range is from 1-100 neV, which corresponds to PQ symmetry breaking near the Grand Unified Theory (GUT) scale. At these lower frequencies, the Compton wavelength is typically larger than the experimental dimension, so the resonators used are similar to lumped-element resonators in which the resonance frequency is not intrinsically linked to the length scale of the detector.

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Track Classification: Axions, Alps, Wisps as dark matter