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Search for Halo Axions with Ferromagnetic Toroids (SHAFT Experiment)[1] ALEXANDER GRAMOLIN, DENIZ AYBAS, DORIAN JOHNSON, JANOS ADAM, ALEXANDER SUSHKOV, Boston University — We present the results of the SHAFT experiment to search for axion-like dark matter in the mass range from 12 peV to 12 neV. The experiment is sensitive to the oscillating magnetic field that would be sourced by an axion-like dark matter halo of our Galaxy interacting with a strong static magnetic field in the lab. We employ toroidal ferromagnetic cores made of powdered iron-nickel alloy to enhance the static magnetic field by a factor of 24. Using superconducting quantum interference devices (SQUIDs), we achieve a magnetic sensitivity of 150 $\mathrm{aT}/\sqrt{\mathrm{Hz}}$. This sensitivity allows us to improve, over a part of our mass range, the existing laboratory limits on the electromagnetic coupling of axion-like dark matter, reaching 4×10^{-11} GeV^{-1} at 20 peV with 95% confidence level.

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