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T-RAX: Transversely Resonant Axion eXperiment

Wednesday 8 June 2022 15:30 (15 minutes)

We propose to use an elongated rectangular waveguide near its cutoff frequency to speed up axionic dark matter searches. The detector's large surface area increases the signal power, while its narrow transverse dimension and tapered-waveguide coupling suppress parasitic modes. The proposed system can fit inside a solenoid magnet and detect the QCD-axion at the axion mass $40 - 400\,\mu$eV. We describe the theoretical principles of the new design, present simulation results, and discuss the implementation.

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