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Solar axion search with TES microcalorimeters and an iron-57 absorber

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The axion provides a solution for the strong CP problem and is one of the promising candidates for dark matter. The leading approach is probing gamma-ray emission from the nuclear transitions associated with the axion-nucleon coupling. Monochromatic 14.4 keV axions would be produced by de-excitation of the thermally excited isotope of iron-57 in the Sun and could be detected as a 14.4 keV gamma-ray via the inverted production process on the Earth. We developed a Transition-Edge-Sensor (TES) microcalorimeter capable of high energy resolution with an iron absorber and conducted a commissioning run using a one-pixel TES microcalorimeter. In this talk, we highlight scientific objectives, the experimental design, and the latest status, including the development of a microwave multiplexer based on microstrip SQUID for scalability.

Alternate track

1. Astro-particle Physics and Cosmology

I read the instructions above

Yes

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