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The Investigating Solar Axion by Iron-57

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The axion provides a solution for the strong CP problem and is one of the promising candidates for dark matter. In 2020, the XENON1T experiment reported an excess of electronic recoil events, possibly interpreting as the solar axion, an enhanced neutrino magnetic moment or the beta decays of tritium. The Investigating Solar Axion by Iron-57 (ISAI) is being developed as a complemented table-top experiment for an independent confirmation of the solar axion scenario. Probing an X-ray emission from the nuclear transitions associated with the axion-nucleon coupling is the leading approach. Therefore, our plan is to search for the monochromatic 14.4 keV X-ray from the first excited state of Iron-57 using a modern noble pixel detector, dubbed XRPIX, under an extremely low-background environment. We highlight scientific objectives, experimental design and latest status.

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