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Commissioning and the first observation of ISAI, Investigating Solar Axion by Iron-57, experiment

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ISAI, Investigating Solar Axion by Iron-57, is an experiment dedicated for independent measurement of an axion-nucleus coupling constant g_{aN} without introducing mixture of the other interactions. Iron-57, the third most abundant and stable iron isotope, would be in core of the Sun. Monochromatic 14.4 keV axion would be produced by de-exiction of the thermally excited isotope in the Sun and could be detected as an 14.4 keV γ via the inverted production process of the isotope placed on the Earth. We developed the experimental setup which is composed of an event-triggered extreme low-background monolithic X-ray pixel detector surrounding the enriched iron-57 foil, passive shields for environmental radiations, position sensitive timing plastic counter to veto cosmic-ray, cryogenic chamber and the readout electronics. In this talk, I will present the experimental apparatus, the commissioning, the first observation, the prospect of sensitivity in current and near future and the upgrade.

Submitted on behalf of a Collaboration?

Yes

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