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Ultra-heavy Dark Matter Detection with the Paleo Detector

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Currently, various dark matter searches are being conducted worldwide, yet its properties remain unknown, and a vast parameter space is still unexplored. Ultra-heavy dark matter with a mass of 10^10 GeV/ or more is expected to exist, potentially as composite dark matter. Several theoretical candidates have been proposed in particle physics, some of which offer intriguing solutions to fundamental problems in the field. Due to its extremely low flux, detecting such ultra-heavy dark matter requires innovative approaches. Paleo-detectors with timescales of approximately 100 million years have significant potential for capturing exotic particle signatures. Additionally, meteorites containing olivine are promising targets for rare event searches, including the detection of ultra-heavy elements.Our current research focuses on evaluating track formation capabilities in muscovite mica and olivine. In parallel, we are developing an optical microscope scanning system based on nuclear emulsion scanning technology. In this talk, we will present the current status of our study and the insights gained so far.

Do you plan to give the talk in person?

Yes

Primary author: NAKA, Tatsuhiro (Toho University)

Presenter: NAKA, Tatsuhiro (Toho University)