Contribution ID: **66** Type: **not specified**

Simulations and Measurements of Backgrounds at the BabyIAXO Site

As part of the axion/ALP search program at DESY, the next generation axion helioscope BabyIAXO aims to discover axions/ALPs produced in our Sun. The experiment will be located in the underground cavern of the HERA South hall and aims to be sensitive to a single (X-ray) photon per year. With respect to this goal, the in-situ background levels have to be understood and characterised in detail to set the stage for the very sensitive ultra-low background detectors of BabyIAXO.
This summer student project focuses on the detailed study of those backgrounds in the HERA South hall. The student will simulate the hall geometry and the signals of background particles from cosmic air showers and surrounding radioactivity in different simplified detector systems under varying conditions. In addition, the student will potentially have the chance to verify these simulations with a simple cosmic particle detection system and to contribute to the background measurement efforts of the IAXO collaboration. If time allows, the student is encouraged to investigate different ML-based techniques in order to discriminate signal from background events or the possibility to determine the polarisation of the X-rays.

Group

FH-ALPS

Project Category

B1. Physics Data Analysis and Performance (software-oriented)

Special Qualifications

Programming languages: python and C++, IT affinity and basic knowledge about machine learning with python very beneficial.

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