Modeling for Surface Backgrounds in the PandaX-II Detector
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Abstract:
This work models surface backgrounds in the energy window for the XMAP search (8-10 keV) in the PandaX-II detector. The surface backgrounds in this region are dominated by the 8 keV iron Kα (Fe Kα) which is the daughter of 188Re, a radio-isotope produced in the XMAP decay. Due to the change loss effect of the surface events, these contamination-correlation ratios with nuclear recoils leading to undetectable backgrounds in the region of interest. Because the mechanism for the charge can remain unknown and the background cannot be cut off efficiently, a detection model is developed to estimate the surface backgrounds.

Keywords: Dark Matter, Liquid Xenon Detector, surface backgrounds

Introduction:
Fig. 1 is a schematic diagram illustrating the energy spectrum of the PandaX-II detector showing the key features of the experiment. The detector is shown in a horizontal view, with the detector modules arranged in a vertical stack. The left panel shows the layout of the detector, with the right panel showing a close-up view of a single module. The detector is made up of several layers of thin, high-purity silicon detectors, with a central module of a liquid xenon detector. The layout is shown with the detector modules arranged in a vertical stack, with the left panel showing the layout of the detector and the right panel showing a close-up view of a single module. The detector is made up of several layers of thin, high-purity silicon detectors, with a central module of a liquid xenon detector.