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BULLKID: Array of particle absorbers sensed by Kinetic Inductance Detectors

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We present BULLKID, a project aiming to deliver a scalable cryogenic detector for coherent neutrino nucleus scattering and low-mass Dark Matter direct detection.
The device consists of an array of silicon targets sensed by multiplexed Kinetic Inductance Detectors (KIDs).
The prototype we present is made of 64 cubic voxels of 5.4 × 5.4 × 5 mm3 each carved out of a 5 mm thick 3" silicon wafer.
The carvings leave intact a 0.5 mm thick common disk acting as a holder for the dices and as substrate for the KID structures.
The resulting array is monolithic and highly segmented in order to avoid individual holding structures that may generate backgrounds.
The above ground unshielded operation of this prototype has led to the characterization of a background level of $2 \cdot 10^6$ counts/(kev·kg·day) flat down to an energy threshold of 160 eV.
We present the status of the project and its furure developement towards an improvement in terms of threshold and active volume of the detector.

Collaboration

Role of Submitter

I am the presenter

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