Contribution ID: **78** Type: **not specified**

Backgrounds from defects in direct detection experiments

A promising strategy for direct detection of sub-GeV dark matter is to look for phonon excitations in crystals. The crystal targets used in such experiments are typically not completely pure, and have impurities or defects. Frenkel defect is an example of a point defect where an atom is dislodged from its position and occupies an interstitial position leaving behind a vacancy. Foreign atoms can also be present as impurities in the detector. These defects and impurities can diffuse and interact to emit energy in the form of phonons, and can potentially create a background for direct detection experiments. We identify potentially dangerous defect interactions and estimate the defect densities and rates of interactions to produce backgrounds. We consider thermal production of defects, typical impurities from manufacturing processes, and defect clusters produced through radiogenic recoils. Having identified these potential sources of backgrounds, we indicate mitigation strategies to reduce such backgrounds and gain sensitivity to sub-GeV dark matter candidates.

Secondary category for the parallel session (optional)

Dark Matter Physics

Primary author: SHOLAPURKAR, Mukul (UC San Diego)

Presenter: SHOLAPURKAR, Mukul (UC San Diego)

Session Classification: Parallel: Dark Matter 1

Track Classification: Parallel Sessions: Dark Matter Physics