

Study of the ionization efficiency for nuclear recoils

Thursday, 9 July 2020 12:30 (0:17)

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We study the ionization efficiency by an integral equation beyond Lindhard's theory, describing the energy given to atomic motion by nuclear recoils in a pure material when the atomic binding energy is taken into account implying a cutoff. We show that the integral equation can be solved numerically, which depends on electronic stopping power and the binding energy. This leads to an estimation of the ionization efficiency which is in good agreement with the available experimental measurements for Si, Ge, and Xe. In this talk, we are also going to expose recent studies to extent the ionization efficiency for Si to lower energies, reaching the region of interest for dark matter and neutrino searches.

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Session Classification : Morning session 2

Track Classification : Contributed talks