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Superconducting Nanowires as Targets for Sub-GeV Dark Matter

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Superconducting nanowires represent a rapidly developing technology with a broad spectrum of applications in fields such as space communications, lidar, and quantum information science. This talk explores the potential of using superconducting nanowires both as targets and sensors for the direct detection of sub-GeV dark matter. These devices offer exceptional sensitivity to small energy deposits in electrons and demonstrate remarkably low dark count rates, making them ideal for probing electron recoils resulting from dark matter scattering and absorption interactions. We present sensitivity plots for a 4.2 ng NbN device with a dark count rate of $5 \times 10^{-4} s^{-1}$ dark count rate and discuss the projected sensitivities for larger detectors.

Primary author(s) : CALABRESE, Roberta

Presenter(s) : CALABRESE, Roberta

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