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Monte-Carlo simulations of heavy inorganic scintillators

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Cryogenic scintillator experiments are typically difficult to optimise by trial and error due to the difficulty of performing repetitive experiments at low temperatures. Monte-Carlo simulations are therefore an attractive option for optimising the light collection from cryogenic scintillators. The talk presents two of the most commonly used packages for the simulation of scintillators: Geant4 and Litrani. A difficulty in performing simulations is determining the input parameters such as the bulk properties (the intrinsic light yield, the scattering and absorption coefficients) and the surface properties. The MCRIM technique for determining the bulk properties is presented as well as AFM measurements of CaWO4 crystals in order to estimate surface properties. Results of simulations with CaWO4 are presented and compared with some published results.

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