

Nu physics in direct detection experiments

Tuesday, 8 October 2019 14:30 (30 minutes)

Direct detection experiments are probing the nature of dark matter particles with increasing sensitivities by looking for their scattering off nuclei (or electrons) in underground detectors. Future experiments, with increased payloads and lower energy thresholds, will have access to wide areas of the parameter space. The search for dark matter is, however, limited by a Standard Model background: the coherent elastic neutrino-nucleus scattering cross section, usually expressed as a “neutrino floor”. The neutrino floor can receive contributions from new physics models in the neutrino sector. I will present the predictions for various new physics models to calculate the maximum value of the neutrino floor, showing that it can be as large as various orders of magnitude. In the light of these results, future claims by direct detection experiments exploring the low-mass window must be carefully examined if a signal is found well above the expected Standard Model neutrino floor.

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Session Classification: Session 5