

Abstract Submitted
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Modeling the Energy Resolution of Xenon with NEST¹ SERGEY UVAROV, UC Davis, NEST TEAM — In addition to explaining the mean yields, NEST (the Noble Element Simulation Technique) can also address the energy resolution degrading effects in noble elements, for both electron and nuclear recoils (ER and NR). Liquid and gaseous xenon will be presented as examples. A non-binomial recombination fluctuation model will be discussed which well describes the intrinsic, supra-Poissonian resolution observed in xenon. It is combined with electric field effects, the Fano factor, and detector efforts, such as finite light collection efficiency and PMT quantum efficiency. In matters of conflicting dark matter search results observed by experiments such as XENON100 and CoGeNT, a stochastic, non-analytic, partially non-Gaussian understanding of the energy resolution for low-energy, WIMP-like nuclear recoils may be part of the solution. ER-NR discrimination can be predicted well with such an understanding.

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