(Re)interpreting the results of new physics searches at the LHC

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Publishing results and data of direct detection experiments

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Direct detection experiments search for dark matter from the galactic halo interacting on earth.

The expected rate and spectral signature of such a signal depends on assumptions of the galactic halo, the dark matter velocity distribution, the dark matter model and more.

Published experimental constraints are made for specific dark matter interaction types and dark matter masses, with most other parameters fixed to nominal models.

Furthermore, the complexity of the inference employed by experiments vary significantly from cut-and-count analyses to toyMC-calibrated profile likelihood constructions depending on the experimental situation. In some cases, tools and likelihoods are provided for recasts, while in other cases only event numbers are available.

Excesses, such as the DAMA modulation, and the XENON1T low-energy electronic recoil excess are both of particular interest to theorists and thus a focus of recasting efforts, and also where details of e.g. background modelling are of the most importance.

In this talk, I will describe the different approaches direct detection experiments have taken to present their data, in particular those cases where efforts have been made to ease interpretation by the general physics community.

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