



Contribution ID: 39

Type: **not specified**

Characterizing dark matter in LHC dilepton spectra

Spectral features in LHC dileptonic events may signal radiative corrections from dark matter and mediators. It is shown using simplified models how these features may reveal the fundamental properties of the dark sector, such as the self-conjugation, spin and mass of DM, and the quantum numbers of the mediator. Distributions of both the invariant mass m_{ll} and the Collins-Soper scattering angle $\cos\theta$ are studied to pinpoint these properties. Constraints on the models are derived from LHC measurements of m_{ll} and $\cos\theta$, which are competitive with direct detection and jets + MET searches.

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Session Classification: Poster social