Contribution ID: **105** Type: **Parallel talk**

The Dark Hyper-Charge Symmetry

Tuesday 15 October 2024 14:15 (15 minutes)

$U(1)$ extension of the Standard Model is well motivated, where the charges of SM fermions are fixed by gauge anomaly cancellations and Yukawa interactions. While the literature extensively discusses anomaly cancellation solutions in which SM fermions are vector-like under new symmetry, allowing the Yukawa structure to remain invariant, chiral solutions in which SM fermions are chiral under new symmetry are not well explored. In this work, we venture into these relatively unexplored chiral solutions, presenting a comprehensive set of solutions for gauge anomaly cancellation through the inclusion of three right-handed dark fermions. We will focus on a particularly intriguing chiral solution and demonstrate, in a model-independent manner using only the Z' interaction channel, that the lightest dark fermion, denoted as F_1, is a viable Dark Matter candidate, and it can meet all current Dark Matter constraints with a mass of M_{F_1}
$gtrsim$150 GeV.

Track type

Dark Matter

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