Contribution ID: **14** Type: **not specified**

Dark Matter in a Left-Right Symmetric Model

Tuesday 3 February 2026 10:25 (25 minutes)

We investigate dark matter phenomenology in a left-right symmetric model based on an (SU(3)_c \times SU(2)_L \times SU(2)R \times U(1){B-L}) gauge theory with a softly broken parity symmetry. The model naturally contains light neutral fermion and scalar states that serve as viable dark matter candidates, with masses ranging down to the GeV scale. The interactions of dark matter are predominantly governed by couplings to left- or right-handed neutrinos, leading to distinct phenomenological features. We analyze the relic abundance, relevant constraints, and detection prospects of these dark matter candidates using several representative benchmark parameter sets, and identify viable regions of parameter space consistent with current experimental bounds.

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