Contribution ID: **48** Type: **not specified**

Minimal Electroweak Baryogenesis with Domain Walls

Thursday 29 May 2025 15:20 (20 minutes)

We propose a novel mechanism for Electroweak Baryogenesis (EWBG) within the real singlet extension of the Standard Model with an approximate $\mathbb{Z}2$ symmetry. Domain walls associated with the spontaneous breaking of the $\mathbb{Z}2$ symmetry feature restored (or weakly broken) EW symmetry in their core. In combination with a CP-violating source, the walls sweeping through space generate the baryon asymmetry below the temperature of the EW phase transition.
We identify the key conditions on the domain wall profiles and evolution, necessary for the realisation of the proposed mechanism. Eventually, we find the relevant parameter space to span singlet masses from sub-eV to 15 GeV, accompanied by a non-vanishing mixing with the Higgs boson. Unlike the standard realisation of EWBG in the minimal singlet-extended SM, which is notoriously difficult to test, this scenario can be probed by a wide range of existing and upcoming experiments, including fifth force searches, rare meson decays, and EDM measurements.
Based on arXiv:2412.10495.

Primary authors: AZZOLA, Jacopo (Technische Universität München); Prof. WEILER, Andreas (Technische Universität München); Dr MATSEDONSKYI, Oleksii (Technische Universität München)

Presenter: AZZOLA, Jacopo (Technische Universität München)

Session Classification: Reheating and Baryongenesis