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SM Fermion Scattering off Charge and/or CP Violating Domain Walls in the 2HDM

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In several models of beyond Standard Model physics discrete symmetries play an important role. For instance, in order to avoid flavor changing neutral currents, a discrete Z_2 symmetry is imposed on Two-Higgs-Doublet-Models (2HDM). This can lead to the formation of domain walls as the Z_2 symmetry gets spontaneously broken during electroweak symmetry breaking in the early universe.

Due to this simultaneous spontaneous breaking of both the discrete symmetry and the electroweak symmetry, the vacuum manifold has the structure of 2 disconnected 3-spheres and the formed domain walls can exhibit lots of special effects in contrast to standard domain walls. In this talk I will focus on some of these effects such as CP and/or charge violating vacua localized inside the domain walls.

I will also discuss the scattering of standard model fermions off such types of domain walls as, for example, top quarks being transmitted or reflected off the wall as a bottom quark.

Collaboration / Activity

none

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