

Renormalization of the Dark Abelian Sector Model and Predictions for the W-boson mass

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The Dark Abelian Sector Model (DASM) is an extension of the Standard Model with an additional spontaneously broken $U_d(1)$ gauge symmetry connected to a dark sector, i.e. the SM particles do not carry the corresponding charge. In addition to the gauge boson resulting from the extra $U_d(1)$ gauge symmetry, the particle content is extended by a further Higgs boson, one Dirac fermion as well as right-handed neutrinos. Employing the $U_Y(1)$ field strength tensor as well as the SM Higgs mass operator (the only two singlet operators of the SM with dimension less than 4) and the right-handed neutrino fields, we open three portals to the dark sector.

In this talk, after an introduction of the model, we discuss a renormalization scheme for the complete model with a special focus on the renormalization of the mixing angles. Finally, as an example of application, we present the prediction for the W-boson mass derived from the muon decay for the DASM.

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