

Implications of Radiative Corrections in the Context of Dark Matter Searches and Precision Calculations in Models with Extended Higgs Sectors

The beyond standard model physics may manifest itself through direct searches, such as the direct detection of dark matter, and indirect searches, such as deviations of precision observables from standard model predictions. In both cases, radiative corrections may be extremely important because new particles can appear in the loop. We discuss the important one-loop and two-loop corrections in the context of dark matter direct detection in models involving the extension of the scalar sectors (e.g., the minimal supersymmetric standard model). We find that the radiative corrections can significantly enhance the direct detection cross-sections, raising the hope of testing dark matter in the next generation of direct search experiments. Furthermore, as part of the precision calculations, we discuss the significance of one-loop and two-loop corrections in calculating the chromomagnetic dipole moment of the top quark in the aligned two-Higgs-doublet model and the conventional two-Higgs-doublet models with Z_2 symmetries.

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