

Precision predictions in the gauge and scalar sectors of the super weak extension of the standard model

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The superweak (SW) force is a minimal, anomaly-free $U(1)$ extension of the standard model (SM) with a complex scalar and three sterile right-handed neutrinos. The SWSM is designed to explain the origin of (i) neutrino masses and mixing matrix elements, (ii) dark matter, (iii) cosmic inflation, (iv) stabilization of the electroweak vacuum and (v) leptogenesis. In this talk we present precision predictions including quantum corrections in the gauge and scalar sectors of such $U(1)$ extensions in general. We apply such predictions in the SWSM to constrain the parameter space in the gauge and scalar sectors of the model. Talk based primarily on papers 2204.07100, 2305.11931 and 2402.14786, all published in Physical Review D.

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