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Accidentally Light Scalars from Large Representations

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In models with spontaneous symmetry breaking by scalar fields in large group representations, we observe that some of the scalar masses can be loop-suppressed with respect to the naive expectation from symmetry selection rules. We present the most minimal model —the SU(2) five-plet —with such accidentally light scalars, featuring compact tree-level flat directions lifted by radiative corrections. We sketch some applications, from stable relics and slow roll in cosmology, to hierarchy and fine-tuning problems in particle physics.

Primary authors: BRÜMMER, Felix (LUPM); FERRANTE, Giacomo (LUPM); FRIGERIO, Michele (L2C); HAMBYE, Thomas (Université Libre de Bruxelles)

Presenter: FERRANTE, Giacomo (LUPM)

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