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Mapping the SMEFT one-loop structure of linear SM extensions

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Linear Standard Model (SM) extensions, defined as new particles that can couple linearly to SM fields, form a motivated subset of simplified models for exploring phenomenology beyond the SM (BSM). Their linear couplings enable them to be singly produced at colliders and searched for directly. To take full advantage of the complementarity between direct searches at high energy and indirect constraints at lower energies, we may integrate out the heavy BSM particles to obtain their effects in the SM Effective Field Theory (SMEFT) framework, parametrised by the Wilson coefficients of higher-dimensional operators. In this talk we map the one-loop dimension-6 SMEFT structure of the scalar and fermion linear SM extensions, extending the results previously obtained at tree level in the literature.

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