

A reduced basis for CP violation in SMEFT at colliders and its application to diboson production

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We show that only 10 (17) CP-odd operators of the SMEFT give the leading, i.e. least suppressed by the new physics scale, CP-violating contributions once we assume that all fermions are massless but the top (and bottom) quark(s). We start with a short review of previous analyses focusing on operators of our reduced basis and list different observables probing their CP violating effects by direct measurements at colliders and by indirect measurements in low-energy observables. Since CP-odd operators typically lead to phase space suppressed interferences, we quantify the efficiency to revive the interference for various observables found in the literature but also for new observables in diboson production. Our new observables are found to be more efficient on the whole experimental fiducial phase space and are complementary to those presented so far as they probe different combinations of operators and get their sensitivities from different regions of the phase space.

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