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Electroweak Baryogenesis from a Composite Higgs Sector

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One of the most appealing explanation of physics at the electroweak scale is given by composite Higgs models, where the Higgs boson is a bound state of a new strongly-interacting dynamics. While the minimal realization of compositeness differs only slightly from the Standard Model (SM), non-minimal realizations, based on larger coset structures, can have a much richer phenomenology and account for phenomena that can't be explained within the SM, such as electroweak baryogenesis (EWBG). In particular, in models based on the $SO(6)/SO(5)$ coset structure (which describe five light degrees of freedom: four belonging to the Higgs and one belonging to a new light CP-odd scalar singlet) the existence of an extra gauge singlet in the Higgs sector influence the strength of the phase transition and its CP-odd couplings provide the extra source of CP violation. Furthermore, at low energy, this set up consisting of the Higgs plus a CP-odd singlet coupled to the fermions, provides the most minimal scenario capable of explaining the baryon asymmetry.

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