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Gravitational waves and baryogenesis from a non-minimal composite Higgs model

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A possible explanation of the origin of baryon asymmetry in the universe is provided by electroweak (EW) baryogenesis, where the asymmetry is generated during a first-order phase transition. This can be realized in the presence of new physics that modify the Higgs dynamics.

Non minimal Composite Higgs models based on the coset SO(6)/SO(5) offer a suitable extension of the SM Higgs sector that can realize baryogenesis.
The scalar sector of the theory is enriched by an additional scalar singlet field that triggers a "two-step" EW phase transition and introduces additional sources of CP-violation.

In this talk I will discuss the dynamics of the two-step phase transition,
with particular focus on the conditions needed for baryogenesis.
An important requirement is the breaking of a discrete Z_2 symmetry associated to the additional singlet, which controls the degeneracy of vacua and the amount of CP violation.

The current bounds on the electric dipole moments of the electron and the neutron impose very mild constraints on the amount of Z_2 breaking, allowing for a successful EW baryogenesis in a large part of the parameter space.

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