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Bubble wall dynamics at the electroweak phase transition

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Bubble nucleation is a key ingredient in a cosmological first order phase transition. The non-equilibrium bubble dynamics and the properties of the transition are controlled by the density perturbations in the hot plasma. We present, for the first time, the full solution of the linearized Boltzmann equation. Our approach, differently from the traditional one based on the fluid approximation, does not rely on any ansatz. We focus on the contributions arising from the top quark species coupled to the Higgs field during a first-order electroweak phase transition. Our results significantly differ from the ones obtained in the fluid approximation with sizeable differences for the friction acting on the bubble wall.

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