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Bubble Wall Velocity from Hydrodynamics

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Cosmological scalar phase transitions are ubiquitous in particle physics models. If they are first-order, they can be tested with gravitational-wave signal and baryon asymmetry they produce. These however, crucially depend on the velocity that nucleated new-phase bubbles reached. In this talk I will present generalized description which builds a bridge between numerical simulations, often used within the community, and the analytical estimates of this parameter. Our method allows one to determine the wall velocity without the necessity of performing full real-time simulations. Moreover, I will explain why some stationary solutions discussed in the literature are not dynamically realized, and provide a selection rule determining their fate.

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