Holographic Phase Transition in Soft Walls: Gravitational Waves and Collider Signatures

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We study the electroweak phase transition within a 5-dim warped model including a scalar potential with an exponential behavior, and strong back-reaction over the metric, in the infrared. By means of a novel treatment of the superpotential formalism, we explore parameter regions that were previously inaccessible. We find that for large values of the t'Hooft parameter the holographic phase transition occurs, and it can force the Higgs to undergo a first order electroweak phase transition, suitable for electroweak baryogenesis. The model exhibits gravitational waves and colliders signatures. It typically predicts a stochastic gravitational wave background observable both at the Laser Interferometer Space Antenna and at the Einstein Telescope. Moreover the radion tends to be heavy enough such that it evades current constraints, but may show up in future LHC runs. Some related references are [1,2,3,4,5]. This work is based on [6].

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