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Holographic phase transitions via thermally-assisted tunneling

Tuesday 20 May 2025 17:00 (15 minutes)

We construct the thermal bounce solution in holographic models that describes first-order phase transitions between the deconfined and confined phases in strongly-coupled gauge theories. This new, periodic Euclidean solution represents transitions that occur via thermally-assisted tunneling and interpolates between the $O(4)$-symmetric vacuum bubble at zero temperature and the high temperature $O(3)$-symmetric critical bubble associated with classical thermal fluctuations. The exact thermal bounce solution can be used to obtain the bounce action at low temperatures which allows for a more accurate determination of vacuum decay rates, significantly improving previous estimates in holographic models. In particular, provided the phase transition is sufficiently supercooled, new predictions are obtained for the gravitational wave signal strength for critical temperatures ranging from the TeV scale up to 10^{12} GeV, some of which are within reach of future gravitational wave detectors.

Mini Symposia (Invited Talks Only)

Plenary (Invited talks only)

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