Contribution ID: **37** Type: **Long talk (20 mins)**

The density of states method, Yang-Mills theories and first order phase transitions

Thursday, 15 December 2022 18:20 (30 minutes)

Phase transitions in gauge theories carry important information about the non-perturbative underlying dynamics. For instance, first-order phase transitions in the early universe generate a primordial gravitational wave background whose intensity can in principle be determined with lattice simulations. However, metastable dynamics at first order phase transitions make precise determination of relevant observables difficult, often leading to large uncontrolled numerical errors. In this talk, I will discuss the first order deconfinement transition in the strong Yang-Mills sector of the standard model using the logarithmic linear relaxation method on the lattice. This method provides a determination of the density of states of the system with exponential error suppression while avoiding the metastability problems. From this, the micro-canonical information can be analysed and thermodynamic observables can be reconstructed with a controlled error.

Type of presentation

20 minute talk

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Lattice QCD

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