Abstract Submitted
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Feynman path integrals over entangled states[1] CHRIS HOOLEY, SUPA, University of St Andrews, UK, ANDREW GREEN, London Centre for Nanotechnology and University College London, UK, JONATHAN KEELING, SUPA, University of St Andrews, UK, STEVE SIMON, University of Oxford, UK — We construct a Feynman path integral over a sequence of matrix product states, combining insights from field theory and tensor networks. The paths that dominate this path integral include some degree of entanglement. This new feature allows several insights and applications: i. A Ginzburg-Landau description of deconfined phase transitions. ii. The emergence of new classical collective variables in states that are not adiabatically continuous with product states. iii. Features that are captured in product-state field theories by proliferation of instantons are encoded in perturbative fluctuations about entangled saddle points. We briefly describe our general formalism for such path integrals, as well as a couple of simple examples that illustrate their utility.

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