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Walking, Nordic Walking, and Deconfined Pseudocriticality

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Not all possible phase transitions occurring in nature are captured by the Landau-Ginzburg-Wilson-Fisher paradigm. An exciting class of such non-Landau transitions are deconfined quantum critical points (DQCP) which exhibit emergent fractional excitations and gauge fields at criticality. The primary example in the study of DQCPs has been a system of half-integer spins on a square lattice with competing interactions. Whether or not this system shows true criticality, however, is a major open question in the field. In fact, numerical simulations for this model either indicate weak-first order behavior or at least a severely anomalous continuous transition between Néel and valence bond solid order. In my contribution, I will explain how weak first-order behaviour manifests itself during a renormalisation group flow. Furthermore, I will discuss effective field theories pertinent to DQCPs such as the (2+1)-dimensional SO(5) Wess-Zumino-Witten theory and the N-component Abelian Higgs model utilising a functional renormalisation group approach based on higher-order regulators and show how walking and nordic walking can appear in these theories.

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