

Quantum mechanics from periodic dynamics: the bosonic case

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Abstract. Following the de Broglie hypothesis, we impose periodic boundary conditions to bosonic fields, in analogy with the Kaluza-Klein and the Matzubara theory. The consequent dynamical compactification of the time dimension turns out to be consistent with special relativity and in particular respects causality. The deterministic mechanics related to these periodic fields give rise to remarkable overlaps with ordinary quantum mechanics. Furthermore, a simplified interpretation scheme for the quark-gluon plasma yields a novel interpretation of the AdS/QCD correspondence.