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Frame (In)equivalence in Quantum Field Theory and Cosmology

Tuesday, 11 June 2019 17:30 (45 minutes)

I will discuss whether or not scalar-tensor theories in the Einstein and Jordan frames are equivalent once quantum corrections are taken into account. To understand this problem it is crucial to carefully define the path integral measure that arises in the quantization of the equivalent classical theories. Generically two measures will differ if the spacetime metrics in the two theories are related by a non-trivial conformal factor. Consequently this difference leads to a finite contribution to the effective action which distinguishes the two frames at the quantum level. This contribution is of particular relevance for classically scale invariant theories since quantising the theory in the Einstein frame is equivalent to a scale invariant quantisation procedure in the Jordan frame.

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