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Review text:

Although the Feynman's path-integral formulation of quantum mechanics looks rather artificial, one of its key merits has been soon recognized as lying in an immediate transfer and extension of this approach to thermodynamics and, first of all, to (relativistic) quantum field theory. In the latter context, this formalism is virtually indispensable, e.g., for a practical and feasible construction of the n-point functions of the theory via the so called generating functionals Z[J]. Naturally, the underlying computation methods are usually tested on the quantum-mechanical or thermodynamical simpler versions of Z[J]. In these tests, an interesting observation of an apparent metric-independence of measurable quantities has recently been reported by Jones and Rivers (cf. ref. [6]) and by Jakubsky (cf. ref. [7]), respectively. Mostafazadeh makes a comment on these results. In particular, he shows that for the specific class of noninteracting models as considered by Jakubsky, the path-integral formalism offers a very natural explanation of his observation of the metric-independence of the thermodynamical quantities. Within the former, more ambitious project of ref. [6] (cf. also [14]), one has to be more careful. In particular, the functionals Z[J] must be redefined in a self-consistent manner which leads, via the corrected source term, to a return of the explicit metric-dependence in Z[J]. In practice, this will imply a reemergence of fairly serious practical computational difficulties accompanying the use of the corrected formulae for the field's n-point functions.