Jones, H. F.; Mateo, J.; Rivers, R. J.

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Path-integral derivation of the anomaly for the Hermitian equivalent of the complex PT-symmetric quartic Hamiltonian.

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Exciting reading for many fresh fans of new developments in the so called PT-symmetric Quantum Theory where the coordinate (typically, x in Schroedinger equation $(p^2+V(x))\psi(x) = E\psi(x)$) is allowed to become complex. Exciting for several reasons:

(1) The authors pay attention to the really exceptional model of this class, with the apparently repulsive $V(x) \sim -x^4$ which ceases to be repulsive inside unusual, "physical" complex wedges of x (cf. the paper [6] by Buslaev and Grecchi, with several later rediscoveries).

(2) In a way extending the work of some of their predecessors, the authors employ the Feynman's path integral approach where they are able to get an agreement with expectations.

(3) On this occasion, an amazing number of underlying technical difficulties is given a compact explanation.

(4) A hope is revitalized that one could sucessfully continue and try to aply the method in more dimensions, up to the case of field theory where a similar project is particularly ambitious (cf. a comment on alternatives to the Higgs mechanism in [7]).

(5) Although the quantity of interest is here the partition function rather than Green functions, the gap has already partially been filled (cf. H. F. Jones, R. J. Rivers, The disappearing Q operator, Phys.Rev. D 75 (2007) 025023).