Abstract Submitted
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Orthogonal Polynomial Projection Quantization: A New Hill Determinant Formulation[1] CARLOS HANDY, DANIEL VRINCEANU, Texas Southern University — We present a new formulation[2] (OPPQ) of the configuration space Hill determinant (HD) approach,[3] and its momentum space counterpart (MRF),[4] that has non of the instabilities of the former,[5] nor the limitations of both. Let $\Psi(x) = \Sigma_n\ a_n\ P_n(x)\ R(x)$, where the P_n 's are the orthogonal polynomials for a given *reference function*, $R(x) > 0$. If the system admits a linear recursive *moment equation* representation, the a_n's become a finite sum with respect to the moments $\mu_p = \int x^p\ \Psi(x)$. Constraining $a_N = 0, \ldots, a_{N-ms} = 0$ gives impressive results for the discrete state energies, surpassing MRF. Contrary to HD, OPPQ is an L^2 formulation in which R(x): (i) does not have to be analytic; and (ii) can be adapted to the asymptotic form of Ψ. It has been applied to 1D and 2D anharmonic potentials, including pseudo hermitian systems, as well as the difficult two dimensional dipole problem for modeling edge structures in nanomaterials.[6]

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