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DEPARTMENT OF MATHEMATICS

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Dear Dr. Varma,

I have been looking again at your work on the derivation of a Schrödinger equation from a Hamiltonian formalism in a higher-dimensional space, & I find that once again there are points I don't understand. This has prevented me looking at your formalism in momentum space, as I had hoped to. Perhaps you could explain the following to me:

In your Fourier series (25) [in the preprint <u>A Generalized Schrödinger Formalism from a Hamiltonian Flow ...</u>] you are keeping $\underset{\sim}{X}$ & t fixed & treating Ψ as a function of Φ. Now the Fourier transform of (24) gives

$$\sum_n \hat{\Psi}(\underset{\sim}{X}, n, t)\, e^{in\Phi} = \sum_n \exp\left(in\int_{t'}^{t} dt'' \frac{L}{\hbar}\right) \hat{\Psi}\left(\underset{\sim}{X} - \int_{t'}^{t} v\,dt'', n, t'\right) e^{in\Phi}$$

However, you cannot proceed from this to your eq. (26), i.e. equate coefficients of $e^{in\Phi}$, because on the right-hand side these coefficients depend on Φ, (although this dependence is well hidden). The point is that $v(t'')$, determined by the trajectory, depends on the initial values $\underset{\sim}{X}(0)$ & $\chi(0)$, which (given the momenta α_i) are functions of $\underset{\sim}{X}(t)$ & $\chi(t)$ & therefore of Φ.

Eq. (26) is crucial to your derivation, & because of the above I cannot see that it is justified. I would be interested in your comments, as it would be nice if your idea could be made to work.

I would like to thank you for your hospitality in Ahmedabad. I very much enjoyed my stay there; it is a pity that it had to be so brief. I think Ahmedabad is the nicest place that I saw during my time in India. I have just got the prints of the photographs I took there, & they have reminded me of what a pleasant time I had.

I hope we will meet again some time.

With best wishes,

Tony Sudbery