Qeios

Peer Review

Review of: "Lindblad Operator Computation for a Single-Mode Quantum Field in a Cylindrical Fibre Based on the Boltzmann Equation to Account for Random Scattering by the Phonon Lattice"

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Lindblad Operator Computation for a Single-Mode Quantum Field in a Cylindrical Fibre Based on the Boltzmann Equation to Account for Random Scattering by the Phonon Lattice

Harish Parthasarathy[1], Anand Srivastava[2], Parul Garg[2], Dushyant Kumar[2], Nidarshana Pandey[2]

The article "Lindblad Operator Computation for a Single-Mode Quantum Field in a Cylindrical Fibre Based on the Boltzmann Equation to Account for Random Scattering by the Phonon Lattice" by Harish Parthasarathy, Anand Srivastava, Parul Garg, Dushyant Kumar, Nidarshana Pandey shows the way to obtain a Lindblad equation for electromagnetic waves in an optical fiber. They consider a cylindrical shape for the fiber.

I think the article has to be rewritten in a more compact form, getting fewer pages. For instance, you do not need to talk about N particles if you are going to limit yourself to a single one particle.

There are some comments on the article:

1. Change in the fourth row 6n by 6N, just above eq. (1).
2. Write down the explicit form of the partition function.
3. What is the value of mass? Because sometimes it seems m=1.

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4. Take out the “?” symbol in (4).
5. What about m in (5)? Check 3.
6. It is not clear the notation (.,.)f(t,r,v). Is it an inner product? Is it properly written eq. (9)?
7. Please, check eq. (10). Maybe you have 1 instead of 2.
8. Just a bit down from eq. 13, the reference is not correct. 1 instead of 2.
9. If you have been working with a fixed number of particles, why do you speak again of N particles?
10. I do not understand why there are suggested problems in a research article below eq. 21.
11. I suggest changing the imaginary number of “j” to “i”.
12. Could you physically explain why there is no z-component of the electromagnetic field inside the fiber?
13. It would be good if you wrote explicitly that gamma(m,n) takes positive and negative values for your problem.
14. Finally, I would like to see the explicit form of the Lindblad equation for the interaction you are considering.

Declarations

Potential competing interests: No potential competing interests to declare.