

Peer Review

Review of: "Fermionic Casimir Effect at Finite Temperature in Hořava–Lifshitz Theories"

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The author uses the generalized zeta function technique to investigate the thermal Casimir associated with a Lorentz-violating massless fermion field satisfying the plate's bag boundary conditions.

The article's introduction provides a review of the literature on the Casimir effect in various contexts, focusing on studies of the thermal Casimir effect for fermions in the presence of breaking of Lorentz symmetry:

Subsequently, the article's text presents an interesting study of the effects of temperature on the free energy of a system of fermions. However, there is an important critical issue that needs to be clarified. The connection between the free energy and the iterated Dirac operator determinant, Eq. II.6, is rather direct and unclear. As is known, the zeta-function regularized determinant possesses a non-commutative anomaly (i.e., the fact that $\det(AB)$ is not equal to $\det A \det B$), so the passage of the zeta function associated with the Dirac operator to the zeta function associated with the iterated Dirac operator is delicate.

This special point, which is crucial for understanding the system involving fermions in the zeta function context, is not sufficiently explicated and can lead to confusion and a need for further clarification in the article. To avoid potential confusion for readers, either the author can provide a clearer demonstration of this connection or add references that clarify this connection.

In general, the paper presents work at a good professional level and can be published considering the above comments.

Declarations

Potential competing interests: No potential competing interests to declare.