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Peer Review

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

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The paper addresses the study of the Casimir Effect for massless fermions with Hořava-Lifshitz couplings. The technique used is a generalization of the Riemann zeta function that gets rid of the ultraviolet divergences that plagued the calculations. This allows for a calculation of the free energy and the Casimir energy. In fact, the latter can be derived from the low temperature expansion of the free energy.

The remarkable result is that depending on the even or odd character of the \kappa integer exponent of the Hořava-Lifshitz spatial term which governs the dispersion relation that violates Lorentz invariance, the results are dramatically different. In the case of even \kappa exponents, both the free energy and the Casimir energy vanish in the low temperature limit, whereas in the odd \kappa case, they do not. Similar results are also

obtained in the high temperature limit.

The vanishing results are a consequence of a very well-known property of zeta functions.

Another remarkable property obtained in the paper is that in the odd case, the sign of the Casimir energy is positive for \kappa= 1, 5, 9 ... and negative for \kappa= 3, 7, 11... meaning that the Casimir force is attractive in the first case and repulsive in the second.

The paper is correct, well-written, and the results agree in some particular cases with other results already reported in the literature.

It will be interesting to know the results for a massive case.

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Declarations

Potential competing interests: No potential competing interests to declare.