Review of: "Modified Hawking radiation of Schwarzschild-like black hole in bumblebee gravity model"

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Potential competing interests: No potential competing interests to declare.

Referee Report

In this article, the authors study the Hawking radiation of the Schwarzschild black hole within the bumblebee gravity model (SBHBGM). Using classical approaches involving Killing vectors and the standard Hamilton-Jacobi method, they compute the Hawking radiation of SBHBGM. They also introduce the Painlevé-Gullstrand, ingoing Eddington-Finkelstein, and Kruskal-Szekeres coordinate systems as alternatives to the naive coordinates, providing insights into gravitational behavior around massive objects like black holes.

Incorporating the Generalized Uncertainty Principle (GUP) into the Hamilton-Jacobi equation, the authors obtain a modified equation characterizing particle behavior near the event horizon. By calculating the tunneling probability using the modified action, they consider the GUP-induced modifications to the emitted particle's behavior, resulting in the derivation of the modified temperature of the SBHBGM. Finally, they study the quantum-corrected entropy of the SBHBGM and discuss the findings with possible future projects.

Overall Assessment:

This paper is well-written and well-organized. The authors provide a clear and concise introduction to the topic, and they review the relevant literature in a comprehensive and informative manner. Their methodology is sound, and their results are presented in a clear and logical manner. The authors also discuss their results in the context of previous work and suggest directions for future research.

Specific Comments:

- The authors' use of the Hamilton-Jacobi method to compute the Hawking radiation of SBHBGM is a nice touch. This approach is relatively straightforward and provides a clear physical interpretation of the results.
- The authors' incorporation of the GUP into their analysis is particularly interesting. It is well-known that the GUP can lead to modifications of Hawking radiation, and the authors' results provide new insights into this phenomenon.
- The authors' discussion of the quantum-corrected entropy of the SBHBGM is also interesting and informative. It is important to understand how the GUP affects the entropy of black holes, and the authors' results provide a valuable contribution to this area of research.

Recommendation:

I recommend that this paper be accepted for publication. It is a well-written and well-organized paper that presents new and interesting results on the Hawking radiation of black holes in the bumblebee gravity model. The authors' work is timely and relevant, and it makes a significant contribution to the field.