

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

Nan Li<sup>1</sup>

<sup>1</sup> Northeastern University

**Potential competing interests:** No potential competing interests to declare.

This paper studies the modified Hawking radiation in the bumblebee gravity model, and also considers the generalized uncertainty principle and the quantum-corrected entropy of the Schwarzschild black hole at the same time.

This paper is clearly written, and the structure is well organized. However, there are several problems, as listed below. The authors should first carefully deal with these issues before this paper can be considered for publication.

1. After providing some necessary background knowledge of the three special coordinate systems, the final results are always directly given, without any detailed derivation! The authors should present what they do in this paper and what is new compared to previous literature. For example,

How did the authors obtain the results in Eqs. (9), (10), and (11)? I cannot find the derivation or any reference.

How did the authors obtain the results in Eqs. (19) and (20)? Actually, these are the essential results to obtain the tunneling probability in Eq. (21), but I cannot find their calculations at all. In contrast, Eq. (18) is trivial, unnecessary to be shown.

How did the authors obtain the results in Eqs. (29), (31), and (32)? Again, the derivation of these important results is absent.

The detailed derivation of Eq. (52) must be provided, because it is the most important result in this subsection.

2. What is  $\tilde{r}_h$  in Eqs. (19), (20), and (21)? Is it the same as  $r_h$ ?

3. In Eq. (25), should the coordinate  $r$  be  $r^{\text{ast}}$ ? Also, should all  $r$  in this subsection be  $r^{\text{ast}}$ ? Otherwise, why did the authors introduce this new coordinate  $r^{\text{ast}}$ ?

4. In the line above Eq. (26), there are two partial derivative  $\partial_v$ . Should they be  $\partial_{\nu}$ ?

5. What is  $\text{bf } e$  in Eq. (39), (42), (43), and (44)? Is it just  $\text{rm } e$ ?

6. In addition, there are several typos in this paper.

In Eq. (1), there is Newton constant  $G_N$ , but  $G_N$  is set to be 1 throughout this paper.

In Eq. (12), a typo "==".

There should be  $-2 \text{Im}$  in both the exponential functions in the denominator and numerator in Eq. (32).

In Eqs. (32) and (60), "exp" should be  $\exp$ , and "Im" should be  $\text{Im}$ .

In Eq. (37),  $r_h$  should be  $r_h$ .

Throughout this paper, the derivative operator "d" should be expressed in one form,  $d$  or  $\text{d}$ .