

# Review of: "An Added Proof of the "Trace Anomaly Redefinition": Equivalent Wick Rotation Conditions"

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Potential competing interests: No potential competing interests to declare.

*Dear author H. W. Maalouf, I read your paper entitled as:*

*An Added Proof of the "Trace Anomaly Redefinition": Equivalent Wick Rotation Conditions*

And I have some suggestions to improve it as follows.

1. Some sentences need more explanation. For instance, what is an `external line` as given in the introduction? It needs to be described more. Does it denote Feynman diagrams with external legs?
2. It is useful to define the chiral anomaly briefly for readers in the introduction section and also the history of experimental research about it. You can see, for instance, the ref. *Nature Reviews Physics*, **volume 3**, pages 394–404 (2021)
3. In the introduction section, you pointed out that your proposal is applicable for pure time-dependent metrics, and so it is useful to give applications for it, for instance, in the cosmological model for the Robertson-Walker time-dependent metric, and to seek its effects, for instance, on the rate of inflation and/or the `Big-Bang`, and so on.
4. In Einstein's rule for summation, in fact, an index should be covariant and the other one with a similar name should be contravariant, while this notation is not regarded in the paper, for instance, see below the formula 2, in which the left-side index is not satisfied with those given on the right side.
5. I read also the first reference where the trace anomaly of the quantum stress tensor expectation value is considered just a geometrical part containing the Gauss-Bonnet term. While in the quantum field theories in curved spacetime, re-normalization of the expectation value of the stress tensor operator of the quantum matter field reaches to a re-normalized covariantly conserved regular stress tensor expectation value with a trace anomaly, in which the trace anomaly has two parts called the state dependent (non-geometric) and the state independent (geometric) (see, for instance, H. Ghaffarnejad, Phys. Rev. D56, 4633 (1997), and references therein). You do not point to this in ref. 1. According to this point, I suggest you add the effects of the state dependent parts of the trace anomaly on your results about the chiral anomaly.
6. Sincerely yours, Hossein

