



	<a href="#">Physical Science International Journal</a>
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	On Spaces with the Maximal Number of Conformal Killing Vectors
	Original Research Article

manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound. process, reviewers are requested to visit this link:

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Reviewer's comment	Author's comment (if agree, highlight that part in the manuscript. If not, his/her feedback here)
<p>In this article, the author(s) investigated the spaces admitting the maximal number of conformal Killing vectors (CKVs). Since this issue has been investigated long before, the author(s) tried to give a self-contained proof that the <math>n(\geq 3)</math>-dimensional spaces are conformally flat if and only if <math>(n+1)(n+2)/2</math> CKVs exist.</p> <p>The manuscript includes several scientifically unsound points below.</p> <ol style="list-style-type: none"> <li>(1) in the introduction "CKVs can be used to construct Killing tensors" is wrong. CKVs give reducible conformal Killing tensors, not the Killing tensors.</li> <li>(2) in the introduction, "special CKV" should be explained in more detail.</li> <li>(3) in section 3, the author(s) discuss CKVs of a flat space. In particular, the two dimensional space(time)s is conformally flat, leading to infinite number of CKVs. I do not understand equation (26), where the discussion is focused only on the regular function <math>f</math> in <math>z</math> and <math>w</math>. It is well known that the generators of 2 dimensional conformal symmetry corresponds to the Virasoro algebra, which includes also singular contributions. Since the author(s) consider the subclasses only, the discussion is insufficient. This issue has been discussed in the textbook "D-branes" by Johnson (Cambridge Monographs)</li> <li>(4) Equation (39) has nothing to do with spaces with maximal CKVs. This equations is a consequence of the first and second Bianchi identities and is valid for any spaces.</li> <li>(5) the discussion in section 4 is the straightforward extension of the argument for the maximally symmetric spaces given by Weinberg (the reference [7] should be cited appropriately). In particular equation (40) is corresponds to the second and the third integrability conditions for the CKVs, implying the Lie derivatives of the Weyl tensor <math>C^a_{bcd}</math> and the Cotton tensor <math>C_{abc}</math> along the CKVs vanish. This issue should be discussed more clearly.</li> </ol> <p>Considering above, I find no strong recommendation for publication of the present review article, since this issue has been widely discussed.</p>	<ol style="list-style-type: none"> <li>(1) It is true that, in general, CKVs give reducible conformal Killing tensors. Nevertheless, they can be used to construct Killing tensors. This is the point I wanted to highlight.</li> <li>(2) I have slightly changed the word "special" to "conformal". I meant conformal Killing vectors, not a scalar function.</li> <li>(3) Following Referee's suggestion, I have added a comment about the Virasoro algebra in the introduction, stating that the since we are dealing with smooth functions, so the Virasoro algebra is a subalgebra of the Virasoro algebra suggested reference.</li> <li>(4) The Referee is right about the new version I have submitted. I have added a comment about the anonymous Referee.</li> <li>(5) In the third paragraph, I have stated clearly that the CKVs are the ones token by S. Weinberg. The curvature of spaces with maximal CKVs is zero.</li> </ol>

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	<u>(If yes, Kindly please write down the ethical issues here in details)</u>	