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Journal Name:	**Physical Science International Journal**
Manuscript Number:	**Ms_PSIJ_28188**
Title of the Manuscript:	**Critical comment on the paper "Some of the Complexities in the Special relativity: New paradoxes"**
Type of the Article	

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PART 1: **Review Comments**

	Reviewer's comment	**Author's comment** *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
Compulsory REVISION comments	The manuscript under consideration is a response to a paper published in PSIJ by Artekha et al., 2016. The paper by Artekha et. al. provides multiple arguments that special relativity (SR) is incorrect. Artekha et al. appear to have several valid points of criticism about special relativity. However, these are marred by: 1) an immature writing style; 2) a failure to adequately explain concepts, so that the readers may misconstrue arguments; and 3) a complete misunderstanding of several aspects of SR, notably length contraction. There is also a tendency to suggest that Newtonian physics is the proper framework, without acknowledging the extensive experimental confirmation of relativistic time dilation and relativistic mass. Artekha et al. seriously mischaracterize SR length contraction. For example, the concept that a 'moving' observer will see the universe compressed in the direction of motion is not valid, as all 'moving' SR observers (in inertial reference frames, IRFs) are able to consider themselves 'stationary' observers for whom there is no length contraction. These misunderstandings produce erroneous conclusions such as that a 'moving' observer would not see themselves length contracted but would see other objects in the same inertial reference frame as length contracted, or that interstellar distances can be compressed to 1 meter for the moving observer. The Fig. 5 paradox of Artekha et al. is a clear example of their misunderstanding of length contraction. It is unfortunate that the manuscript was published with	

	such substantial errors. 1. There are several problems with the rebuttal manuscript. It is also written in an immature style with snide comments that are not helpful. 2. For the main section on the "coeval" twin paradox, the author often focuses on the badly-worded sections of Artekha et al. (e.g., their snide statement that SR must imply a "senescence" effect) without addressing the argument that acceleration does not have an appreciable effect on elapsed time for twin pardoxes. The author of the rebuttal then performs basic relativistic calculations to show that the two "coevals" will have equivalent ages (based on equivalent time dilation) when they meet at the central point. However, the point of the Artekha et al. "coeval" paradox is that according to SR, each "coeval" should see the other as younger. The author of the rebuttal has attempted to rebut (or explain) the paradox with simple math calculations that show that each "coeval" thinks the other "coeval" is younger. This does not explain the paradox – it merely illustrates what Artekha et al. have indicated is the conclusion of SR. Artekha et al. point out that according to SR, each "coeval" (as well as an observer at the central point) would each think that all other observers/clocks are experiencing time dilation – yet when clocks are compared at the central point, it is not physically possible to have every clock be time dilated relative to every other clock when they are directly compared. So, the rebuttal does not explain/solve the paradox. The paradox is not so easy to solve. A differential simultaneity argument for the paradox would imply that the perceived time dilation is due to each observer	

	seeing the other observer's past. However, differential simultaneity requires a distance between the observers, and the exchange of time information at the central point (even for both "coevals" in flight) can be accomplished with no appreciable distance between the "coevals". Additionally, one could address the situation where the "coevals" decelerate and arrive at the central point where their clocks can be directly compared to each other (and to the clock at the central point) in the same IRF. Artekha et al. presented arguments that the effect of acceleration on the extent of time dilation is negligible. These arguments are not new, and have been published decades before. When all of the clocks are compared directly in the same IRF, would all three clocks show the same time, or would the two "coevals" be time dilated relative to the clock at the central point? In either situation, how would this be consistent with SR for which every 'moving' clock should be time dilated relative to every other 'moving' clock (and in this situation, even the clock at the central point can be considered 'moving')? Trying to present arguments that experiencing deceleration makes the time dilation of the two "coevals" absolute is unlikely to counter the arguments that the effects of acceleration can be decoupled from the extent of time dilation. Additionally, such arguments would not solve the problem with comparisons in-flight (described above). 3. In the author's mathematical exercise, the author miscalculates the ages expected for each "coeval". The author inherently takes the point of view of an observer at the meeting point, which causes problems. Each "coeval" can consider themselves at rest with the central point moving toward them at a speed v over a distance of d; and the other "coeval" moving toward them at a speed described by the relativistic velocity	

	addition formula [$2v/(1+v^2/c^2)$] over a distance of 2d (not d, as the author states). Each "coeval" will expect the other "coeval" or an observer at the central point to be younger by the formula: $\Delta t' = \Delta t(1-v^2/c^2)^{0.5}$. For the "coeval" comparison, the velocity is derived from the relativistic velocity addition formula (we will call it u) and the elapsed time (Δt) is the distance (2d) divided by the velocity (u): $\Delta t' = (2d/u)(1-u^2/c^2)^{0.5}$. The author's answer is not equivalent to this because of errors in the distance and how the relativistic velocity addition formula is used. 4. The author indicates that the "simplified" Lorentz transformation time equation is used for non-inertial reference frames. This is not correct. The "simplified" formula is obtained by substituting x = vt for x in the full equation – as first shown by Einstein in his 1905 paper. Therefore, the "simplified" formula is to be used for the analysis of constant-velocity, linear inertial reference frames, for which x = vt. 5. The author is correct that Artekha et al. are often mischaracterizing SR or making unsupported statements (e.g., their unsupported conclusion about "universal time", and their discussion of length contraction pardoxes, etc..). However, the author's arguments are not fleshed out with mathematics or Minkowski diagrams and are presented as statements of fact without an in-depth discussion of the error (or even what the correct situation should be). Additionally, the author's arguments are themselves generally not coherent or correct (e.g., the author's insights into the length contraction paradoxes on page 5 and 6 does not make sense as written; and the argument on rotating frames is too simplistic – ignoring the complexity of the application of relativity to rotating	

	frames, and observing the question only from the 'stationary' perspective, which is not what Artekha et al. were referring to, and again misses the point of the paradox). 6. In summary, the manuscript misses the point of the main paradox and does not provide satisfactory rebuttals for the other points.	
Minor REVISION comments	There are some typos in the manuscript, including the name of the first author of the Artekha et al. manuscript.	
Optional/General comments		

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