Review of: "Study of EEG characteristics while solving scientific problems with different mental effort"

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Potential competing interests: The author(s) declared that no potential competing interests exist.

The study investigated the EEG indicators of mental effort during solving scientific problems. An ERD/ERS approach to the study of the mental effort during solving scientific problems was applied. It was found that the increase of the complexity of the scientific problem was associated to an increase of theta synchronization in the frontal region and lower alpha desynchronization in the parietal and occipital regions. Also, upper alpha desynchronization demonstrates a widespread enhancement across the whole brain.

The study has theoretical and practical importance. In particular, the results suggest that the mental effort during solving scientific problems activated brain regions related to working memory, visuospatial processing, semantic processing. This study proved the reliability of EEG to evaluate the mental effort.

In general, I would like to support the study. But I have some suggestions could help authors to improve the manuscript quality.

1. The experimental process is well described, but I do not understand for what purpose the control task was used if the comparison with the control task was not described in the study?
2. Was EEG registration carried out when the participants solved the control task?
3. The sample included only 25 participants. Could such a number of participants provided sufficient research power?
4. The results of the study are described rather briefly, while the discussion is a very detailed. I would like to see a more detailed description of the results, for example, did the brain activity differ when solving a control task?
5. In Figure 4, please clarify what the letters R and A mean?