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Subject: Review on the bachelor thesis by Tereza Kaiserová „High energy density plasma - induced transformations of early planetary atmospheres and their impact on early global climate"

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The bachelor thesis by Tereza Kaiserová is aimed at investigating the possible accumulation of various nitrogenous oxides, like N2O and NO, in the Hadean atmosphere, which might provide a solution for the so called faint young Sun paradox. The candidate uses impact chemistry and simple prebiotic feedstock materials, like N_2, CO_2, HCHO, $HCONH_2$ to generate these compounds and demonstrate that the atmospheric N_2O concentration achieved this way could exert a substantial greenhouse effect on the early Earth. In addition, in several experiments the candidate has tested the catalytic effect of various highly plausible minerals and rocks on the outcome of the impact synthesis.

The dissertation work is structured as follows. The first 20 pages provide a perfect introduction to the topic, in particular, discussing the most important factors influencing the Hadean climate and the early evolution of the terrestrial atmosphere. After a concise description of the experimental work done a rather extended part is devoted to the summary of the results obtained. This is followed by a thorough analysis of the experimental findings in light of available literature data. Finally, the dissertation concludes that extraterrestrial impacts could produce high enough atmospheric N_2O concentrations to compensate for the substantially lower output of Sun during the Hadean.

Overall, the present dissertation is based on a very solid scientific work and a very original idea. The results obtained are of high scientific value and may provide a good basis for a future scientific publication. For these reasons I strongly recommend the candidate for the Bachelor of Science degree.

Judit Šponer, Ph.D.