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Josef Malek and the Habilitation Committee for RNDr Jakub Velímský, Ph.D.
Faculty of Mathematics and Physics, Charles University
Prague
Czech Republic

Dear Prof. Malek and esteemed colleagues,

I am pleased to provide this report, constituting my review of the Habilitation file submitted by RNDr. Velímský. My apologies for the belated nature of this report. A variety of circumstances compounded by the tragedy of the COVID-19 pandemic have greatly impacted all aspects of our schedule and capacity to meet competing and exceptional demands. While the situation remains far from normal, I have been able to complete my review of the file including the thesis and the included scientific publications, and after detailed reading and consideration I have come to a positive conclusion.

I will give only a brief summary here. I've provided a number of comments within a digitally annotated copy of the PDF file containing the thesis and attached paper. This can be shared with the candidate as you see fit.

RNDr. Velímský's work is well known to me, and he has an impact of international stature within the (admittedly small) community of global scale EM induction researchers. This is a field that dominated the first half of my scientific career, and I have trained a couple of generations of researchers who have remained active in it including some of the candidate's co-authors, although personally I have not worked with him. I can declare that I am free of either personal or professional conflict of interest in reviewing his thesis and supporting materials.

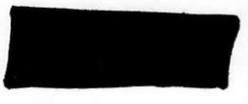
RNDr. Velímský is a mathematical geophysicist whose work concentrates on developing the mathematical basis for forward and inverse modeling of the internal conductivity structure of the Earth, generally on a global scale. He also works to advance application of numerical solutions for this effort. He is not, however, an applied geophysicist who interprets the geological meaning of resulting models. There is a need for mathematical geophysicists of course, but as my own career has progressed I have seen increasingly the value of working ever more closely with geophysicists in other specialties (seismology, potential fields, etc.) as well as with petrologists and geochemists, so that the application of one's work can have far greater impact beyond that of a modeling exercise. I believe RNDr. Velímský is at a stage of his career where this next leap in *synthesis* between methods and observations and joint interpretation and even joint inversion would greatly magnify the impact of his work.

It is also gratifying to see someone of his capabilities continuing to research deep Earth structure. As my career progressed I have moved my focus ever closer to the surface where many practical implications lie. I've seen this in my students and postdoctoral advisees as well. There are very few who continue the

effort to understand processes in the lower mantle and near and below the core-mantle boundary using electromagnetic methods, so in this regard RNDR. Velímský occupies an important niche.

If one reads the comments I have distributed throughout the PDF of his thesis submission, the impression I provide, particularly regarding the older work in his portfolio, is that I am somewhat critical both of his approach and persistence in using 1-D modeling methods, and his incomplete knowledge or reference to the available literature. This was meant as a criticism, since I think had the candidate been more aware of developments along the lines of 3-D global scale modeling that had already been undertaken elsewhere, as well as in full waveform time-domain modeling, that he might have arrived at the really excellent work that is reflected in the final several papers in his portfolio. These latest works are of considerable significance, and on that basis I have formed my opinion that his thesis be approved by the committee. I look forward to seeing RNDr. Velímský's continued work in this field and no doubt the advances we can expect from his current research track.

Yours sincerely,



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