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Prof. Zdeněk Doležal, Vice-Dean of Fac. Math. Phys., Charles Univ., Research and Intern. Affairs Department Ke Karlovu 2027/3
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Fribourg, December 28, 2022

Concern: **Review Habilitation Dr. Jan Mistrík**

Dear Prof. Doležal,

It has been my great pleasure to read the Habilitation thesis of Dr. Jan Mistrík that is entitled "Light Polarization a Probe of Nanomaterials – Application of Spectroscopic Ellipsometry and Magneto-Optics".
In his Habilitation thesis, Dr. Mistrík presents a well-chosen and organized selection of his experimental work on the optical and magneto-optical properties of various kinds of solid state materials. The latter range from bulk materials with interesting structural anisotropy and/or magnetic properties to corresponding thin films, multilayers and related nanostructures. I am convinced that the studies of Dr. Mistrík are of great interest to a large research community that benefits from his precise determination of the optical and magneto-optical constants and the structural properties of the various solid state materials and nanostructures.

The Habilitation thesis of Dr. Mistrík starts with a rather detailed and well-structured introduction of the spectroscopic ellipsometry and magneto-optical techniques that are relevant to the understanding of the presented work. I especially appreciate that Dr.

Mistrík presents the fundamentals of both techniques in the framework of a coherent formalism that highlights their close relationship with respect to the control and analysis of the polarization of light. I also like that the presentation of the theoretical framework is underlined by examples of experimental spectra and their analysis and modelling. Particularly interesting to me is the discussion of the optical scatterometry technique and its application to the characterization of nanofabricated arrays of non-magnetic and magnetic materials.

In the second part of his Habilitation thesis Dr. Mistrík presents a sufficiently detailed outline of his contributions to the fields of spectroscopic ellipsometry, magneto-optical, and scatterometry studies of solid state materials. I am very impressed by the wide range of problems and materials to which Dr. Mistrík managed to contribute substantially with his magneto-optical studies. The success of his work is documented by the numerous publications in high level scientific journals that are briefly motivated and summarized in section II and reproduced in section III of his Habilitation thesis. I am equally impressed by his multiple collaborations with industrial partners from Czech Repulic and Japan that are also briefly described in Section II.

Overall, I can confirm that the Habilitation thesis of Dr. Mistrík contains a sufficient amount of experimental work that is truly original and of a very high quality with respect to the employed measurement and modelling techniques. I am rather impressed by the broad spectrum of experimental techniques that Dr. Mistrík has mastered and managed to apply to solve interesting problems that are likewise related to fundamental and applied science.

Finally, I would like to comment on the output of the plagiarism check which suggests a sizeable overlap with already published work. Here, I would like to remark that for the vast majority of this published work Dr. Mistrík is listed as an author or coauthor. I consider this a normal practice and not relevant in terms of plagiarism. Otherwise, I see no indication of a critical overlap with work that has been published by others and has not been cited adequately.

In summary, I would like to congratulate Dr. Mistrík to his excellent Habilitation thesis that presents a very pedagogical introduction and a well-structured overview of his original and outstanding scientific work. I highly recommend that

this Habilitation thesis should be accepted by your Faculty of Mathematics and Physics.

With best regards, yours

Christian Bernhard