Technische Universität Berlin

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Fakultät V
Verkehrs- und
Maschinensysteme

Institut
für Mechanik

LKM
Lehrstuhl für
Kontinuumsmechanik
und Materialtheorie

Univ. Prof. Dr. rer. nat.
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Dissertation council on the basis of
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Ihr Zeichen	Ihre Nachricht vom	Unser Zeichen	☎ (030)	Datum
		WHM	314-27682/ 22332	28/05/2018

To chairmen of dissertation council D 212.232.30, Dr. Phys-Math. Sc., Prof. Tovstik P.E.

Subject: review on the thesis abstract of Ms. Aleksandra B. Vakaeva
"Investigation of nearly circular defects in solids on the macro- and nanoscale level".
The thesis was submitted for the degree of candidate of physical and mathematical sciences on the specialty 01.02.04 – Mechanics of Solids.

Dear Sir or Madam!

It is a pleasure to write this report on the thesis of Ms. Aleksandra Vakaeva. May I start by saying that she was a guest researcher at our institute for several months. During her stay I had the privilege to listen to several presentations on the various topics of her thesis, which impressed me very much.

Her work is devoted to the development of new theoretical methods for solving problems of nearly circular defects in solids at the macro- and nanoscale level. There is also the effect of the defect's size; the defect's shape and the degree's of deviation of its boundary from the circular shape on the stress-strain state of solid are represented in the investigation. The theory of analytical functions and mathematical analysis, Goursat-Kolosov complex potentials, Kolosov-Muskhelishvili representations, Gurtin-Murdoch surface elasticity theory and the boundary perturbation method are used to get theoretical calculations and research. The correctness of the problem formulations and the use of modern representations and methods of the theory of elasticity confirm the reliability of the results.

I think the very cumbersome analysis led to results that are of very high scientific and practical importance.

The abstract of the thesis sufficiently reveals the content of the dissertation research. Based on the author's abstract, the thesis seems to be a completed work on a more than adequate scientific level. The results presented in this research are sound, the relevance of the topic is evident and the conclusions are justified.

The main results are reflected in 16 publications, including 5 papers indexed in Scopus and WoS. The work was presented at various seminars in universities and on the international high-level scientific conferences. The thesis abstract is written in technically qualified and formally correct manner. The content corresponds to the selected specialty. The thesis "Investigation of nearly circular defects in solids on the macro- and nanoscale level" submitted by Ms. Aleksandra B. Vakaeva for the degree of candidate of physical and mathematical sciences on the specialty 01.02.04 – Mechanics of Solids, meets the requirements of the Higher Attestation Commission (p. 9 "Regulations concerning awarding of academic degrees").

I consider that Ms. Aleksandra B. Vakaeva, author of the thesis, deserves the award of the degree of candidate of physical and mathematical sciences on the specialty 01.02.04 – Mechanics of Solids.

I remain yours very truly,

Wolfgang H. Müller
(Univ. Prof. Dr. rer. nat.)

Univ. Prof. Dr. rer. nat. Wolfgang H. Müller
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