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Freiburg, 13 July 2015

Assessment of the **PhD thesis** of Mr. **Jakub Trubač**, Prague  
**„Origin of compositional and textural zoning of shallow level granitoid plutons“**

In his PhD thesis, written in scientifically proper English (some chapters also in Czech), Mr. Trubač clearly presents himself as a granitoid petrologist focussing on the structural evolution, compositional and textural zoning in low level granitoid intrusions. He uses various approaches including detailed structural field mapping and state-of-the-art analytical techniques including crystal size distributions (CSD), anisotropy of magnetic susceptibility (AMS), gravimetry and computer based textural analyses. Mr. Trubač illustrates the application of these approaches on two plutons from different parts of the Bohemian Massif as case examples, namely the Říčany pluton from the Central Bohemian batholith and the Melechov pluton from the Moldanubian batholith. The chemical composition of the composite Říčany pluton was also employed for viscosity simulations, radiogenic isotopes were employed for source characterization, and U-Pb LA-ICP MS dating, accompanied by CL investigations, was carried out on zircon and monazite for age determination.

The PhD thesis is presented in a cumulative form and contains a compilation of publications and publication manuscripts. It comprises a synthesis followed by seven journal or journal-like articles. The synthesis consists of a technical description of the analytical methods preceded by a preface in which Mr. Trubač explains the leading theme and the underlying scientific questions of his work, followed by a general introduction and description of the three major chapters: (I) Magma differentiation and pluton zoning, (II) Internal structure of zoned plutons, and (III) Zoned plutons in various tectonic settings (chapter III). Each of the three chapters includes two or more publishable or already published manuscripts all of high quality. The papers presented in Chapter



I (2 papers) and Chapter II (2 papers) deal with the Říčany and Melechov plutons, and present the major outcomes of Mr. Trubač PhD thesis. Chapter III contains three co-authored manuscripts on (1) the deformation history of the Devonian Štěnovice and Čistá plutons, (2) other late-Variscan plutons from the Moldanubian Batholith (Ševětín Pluton) and (3) a plate kinematic model based on Variscan plutonism in the Bohemian Massif. The major outcomes of the work are discussed in the summary chapter.

The strength of Mr. Trubač's work is the integration of a variety of geological methods. Presenting such a large quantitative dataset and the ensuing interpretations and discussions is a challenge. I can complement Mr. Trubač without any doubt that he achieved this goal successfully. For example, for the two main facies types of the shallow-level Říčany pluton the field data were complemented with numerical simulation of conductive cooling of these plutons using the finite element method leading to a thermal evolution model of the pluton involving vertical overturn of a stratified crustal magma chamber. Besides, a record of helical magma flow mechanism was discovered in this pluton. Thus, careful reconciliation of the data brings him in a position to develop a new conceptual model for the evolution of composite plutons. Such model also provides some new interesting insights into emplacement mechanisms of granitoid magma in the upper crust and the origin of a reverse vertical zoning pattern. Other noteworthy results of Mr. Trubač's research work include: (1) pinpointing the three-dimensional shape of the Melechov pluton on the basis of lithological zoning and magnetic fabric analyses and (2) new findings on the timing of the formation of the fabric markers within nested granitic diapiric intrusions.

Mr. Trubač is the author or co-author of seven manuscripts three of which as first author and some of these are already published in international journals. He has also published another paper (e.g. Trubač et al. 2009) on the magnetic fabric characteristics of the Říčany granite not included into the dissertation (but for reasons unclear to me). Although I am not overly familiar with the Czech university benchmarking system for PhD thesis, in the German system this work would certainly have been considered as an exceptional contribution to earth science. In my opinion Mr. Trubač has done an outstanding research job. He has shown that he is able to address and solve complicated geological questions in that he has produced scientifically convincing answers, based on a variety of geological methods.

I therefore advise to give the thesis the highest mark of a doctoral degree,

Summa cum laude (1.0)

Wolfgang Siebel