

DOCTORATE AT THE CHARLES UNIVERSITY IN PRAGUE (Faculty of Mathematics and Physics, Department of Surface and Plasma Sciences)

Applicant: **Mgr. Josef Havlíček**

Title: **Study of Equilibrium Magnetic Configuration in Tokamak Type Devices**

Report by: **Prof. G. Van Oost, Ghent University (Belgium)**

This is a well written and very well documented study of the tokamak COMPASS magnetic field configuration & power supplies, and of MHD equilibrium reconstruction, which are very important for the control and feedback of the tokamak plasma column, as well as for the calculation of the power balance during the non-stationary phases of the discharges. This elaborate work is based on a sound methodology and scientific approach. The English could be improved.

The doctoral thesis is subdivided in 5 chapters. After an introduction, Chapter 2 presents an overview of the COMPASS tokamak and the available diagnostics, in particular the magnetic diagnostics. The subsequent Chapter 3 describes the magnetic field systems of COMPASS in a way suitable for physicists. Chapter 4 deals with the equilibrium reconstruction with emphasis on the numerical reconstruction of the MHD equilibrium. Chapter 6, finally, summarizes all results in a conclusion chapter and some future perspectives of this work are given.

Final appraisal:

Overall, the scientific quality and level of the work is very good, which is also supported by the fact that several topics covered in the work are the subject of published peer-reviewed articles.

The candidate showed in this work his skill to develop a complicated code, to give an excellent physics engineering description of the COMPASS magnetic field systems and power supplies, and his capability of making use of all techniques at his disposal, and of looking for adequate ones when not available, in order to reach the goals.

The present doctoral thesis research substantially contributed to the reinstallation and commissioning of the tokamak COMPASS at IPP Prague, and paved the way for those who will continue experimental research on COMPASS.

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