Preface

The 1st Conference on Physical Modeling for Virtual Manufacturing Systems and Processes was held during June 7-9, 2017 in Speyer, Germany.

The conference is the result of the International Research Training Group (IRTG) 2057 "Physical Modeling for Virtual Manufacturing Systems and Processes", funded by the German Research Foundation (DFG) at the University of Kaiserslautern. The IRTG began on 01 July 2014. Partner University of the University of Kaiserslautern is the University of California, with its locations in Berkeley and Davis.

The aim of the research in the IRTG is to provide the planning of production on a new basis. Production is already planned from a single machine to a complete factory with the help of computer models. What these models are lacking, is a description of the actual physical properties. Based on such models, it will be possible to calculate key properties of a production line as the quality of the products or the energy consumption of a factory in advance and to perform targeted improvements. In particular, the physical interactions of the three levels: factory, machine and process are to be considered.

In addition to the excellent research program, the IRTG is characterized by a unique training and support concept of the PhD students involved. This enables every students to finish their PhD in three years in their respective field of research, but also the training of key qualifications, as well as the seamless exchange of scientific knowledge and staff at all levels and in all disciplines.

At the conference the progress and the results of the first cohort of PhD students were presented. The conference was complemented by talks of 10 international guest speakers from computer science and manufacturing engineering. The proceedings contain 22 peer-reviewed papers on Physical Modeling for Virtual Manufacturing Systems and Processes.