

RESEARCH SCHOOL ON FUNCTIONAL ANALYSIS AND PDES

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In planning our participation in the CIMPA Summer School "Research School on Functional Analysis and PDEs" in Khovd was assumed that 5 people from Austria would attend: two lecturers, Prof. Anton Arnold and Prof. Ewa Weinmüller (each with four one-hour lectures) and three students, BSc Merlin Fallahpour, Dr. Giacomo di Gezu and MSc Tobias Wöhler (each with a lecture on 30 minutes). Due to various circumstances, this was not possible, so finally Prof. Weinmüller with BSc Fallahpour and MSc Wöhler participated in the summer school in Khovd, Mongolia. More information about the summer school can be found at <http://www.cimpa2017.mn/>.

Presentations at the summer school included 9 scientists from Germany, France, Japan, Austria, South Korea and Switzerland. Approximately 30 students participated coming from Cambodia, Mongolia, Austria, Pakistan, Philippines, South Korea and Vietnam. Because of the illness of Prof. Arnold the visit with Prof. S. Tang at Peking University had to be cancelled.

Prof. Weinmüller gave a series of lectures that covered the analysis, numerical methods and principles of software development for singular boundary value tasks that have to deal with ordinary differential equations.

Applications were shown on how to apply special types of partial differential equations to solve the solution of singular problems numerically. These were exemplified by the Schrödinger Equation, Ginzburg-Landau equation, quasi-parabolic equation and Korteweg-de Vries Equation that were discussed.



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Thanks to this summer school, new contacts were established, which led to cooperations with Yonsei University in South Korea (Prof. Seick Kim, Dr. Sukjung Hwang and MSc Sunghin Lee), and in the Philippines with Diliman University (Dr. Renier Mendosa). Contacts were made with Dr. Nguyen Duong Toan of the University of Haiphong in Vietnam. Here another meeting was agreed for March 2018 in Hanoi, at the conference "High Performance Scientific Computing, Modeling, Simulation and Optimization of Complex Processes".

The contact to Yonsei University is about solving the Helmholtz equation. Before one begins to analyze this partial differential equation, a simulation of a parameter-dependent singular ordinary differential equation gives first insights.

In the discussion, it was possible to transfer the incorrect initial value problem into one to formulate a boundary value task so that it can be treated numerically. BSc Merlin Fallahpour will have access in the near future to the "bvpsuite" code developed at the Vienna University of Technology that is used to perform this simulation. In contact with Diliman University in Philippines it is planned that master students who are interested in a student exchange in such topics intending to integrate singular ODEs in Vienna, they may do part of their master thesis under the instructions of Prof. Weinmüller. Since at present the Philippines government strongly supports travels, the travel expenses and daily expenses of the students will be carried by the Philippine side.

Possible further, at present though not decided, contacts with Pakistan and Cambodia will be established.

