Applications are invited for 2 PhD positions at the Institute of Mathematics TU Berlin.

PhD - stipend full time -

Salary: monthly 1.468,00 €

The positions are funded by the Einstein Foundation Berlin through the project “Model reduction for complex transport-dominated phenomena and reactive flows” with principal investigators, Christopher Beattie (Virginia Tech), Rudibert King (TU Berlin), and Volker Mehrmann (TU Berlin).

Faculty II – Institute of Mathematics

Reference Number: EVF 2014-201-PhDs (to be filled starting as soon as possible until 31st December, 2017 – with possible continuation / closing date for applications May 15th, 2015)

Working field:

Model reduction for simulation and analysis of turbulent reactive flows.

The drive to minimize emitted pollutants and greenhouse gases in next generation power systems creates a pressing need for greater capabilities in the modeling, simulation, and control of reactive flows. This need is further heightened when considering the effective management of unsteady flow characteristics of high efficiency, pulsed combustion systems currently under design. These models inevitably contain significant uncertainties as well, that may range from the structure of reaction mechanisms to the variation in machining tolerances. Accounting for these uncertainties is critical for realizing the improvements in performance that are anticipated and model reduction has an important role to play in making design and control for such innovative reactive flow applications tractable.

The principal objective of this project is to develop rigorous mathematical and computational frameworks for determining compactly-represented, high-fidelity reduced models that accurately approximate the response of complex dynamical systems such as those describing the behavior of pulsed combustion power systems. Such frameworks should include both a priori and a posteriori estimates of response error produced by such reduced models. An important objective of the project will be to provide accessible and scalable computational tools for model reduction that can be used by scientists and engineers in the analysis and approximation of dynamical systems.

Requirements:

The successful candidate will hold a Master degree in either Mathematics or a related field and will be expected to have a strong background in numerical analysis and computational fluid dynamics. Experience in the modeling of turbulent reactive flows is desirable. Expertise in model reduction will be an asset.

The capacity for independent work and critical judgment are essential. The candidate will be expected on occasion to act as a bridge between members of the collaborating centers and play a role in mentoring students in the group.

Please send your application by email with the reference number including a curriculum vitae, publication list and three letters of recommendation to Sabine Mokri (mokri@math.tu-berlin.de) / Kerstin Ullrich (ullrich@math.tu-berlin.de) or in writing to Technische Universität Berlin, Sabine Mokri / Kerstin Ullrich, Sekr. MA 4-5, Straße des 17. Juni 136, 10623 Berlin.

To ensure equal opportunity between women and men, applications by women with the required qualifications are explicitly encouraged.

Handicapped applicants with equal qualifications will be favored.

Please send copies only. Original documents will not be returned.