A MASTER PROJECT IN APPLIED MATHEMATICS/ENGINEERING

A discontinuous Galerkin approach for the BGK equation

This project concerns coding of a finite element scheme for two dimensional BGK (a simplified version of the Boltzmann) equation. The underlying physics is describing the collision-less plasma of particles in form of a, hyperbolic type, integro-differential equation for gas/fluid dynamics. Being collision-less the underlying equation is linear. The gas/fluid is passing through various channels with different geometric cross-sections.

We have a complete theory and a "semi-functioning" code that works for several cross-sections, BUT NOT FOR ALL.

The project is to fix the code (or write a new one) that works for the remaining geometries, e.g. channels with triangular cross-sections.

The application areas of this project is huge ranging from nuclear energy: fission/fussion, to medical physics: radiation oncology, as well as environmental research, etc.,...

Both Anders Logg and Mohammad Asadzadeh will be available to help with questions: I can answer general theory question, but Anders has written the main code and is expert both in theory as well as coding. The interested candidate(s) will be supplied by up-to-date research articles relevant to the subject of the project.

A successful outcome can open "good opportunities" for the performing candidates.

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