Paris, March 9, 2015

post-doc position
INRIA Paris-Rocquencourt

Context: INRIA project-team SERENA / ERC consolidator grant GATIPOR

Subject: A posteriori error control and adaptivity for inexact solvers in porous media flows

Contents

Complex porous media flows are described by systems of unsteady nonlinear (degenerate) partial differential equations. Their numerical simulation interconnects modeling, regularization, linearization, discretization in time and in space, and algebraic solvers. In the framework of this post-doc fellowship, one shall use the theory of *a posteriori error estimation* to asses the overall error of a numerical simulation, identify its different components, and develop and analyse novel fully adaptive strategies. Theoretical a posteriori error analysis including proofs of convergence of the new algorithms shall be tackled. Implementation into academic scientific calculation codes like FreeFem++ or DUNE should be performed and practical applications to current environmental problems like nuclear waste storage should be addressed. The work will be carried out in the framework of the European Research Council consolidator grant GATIPOR (Guaranteed fully adaptive algorithms with tailored inexact solvers for complex porous media flows), in the SERENA (ex POMDAPI) project-team of INRIA, in collaboration with CERMICS at Ecole de Ponts ParisTech.

References

http://cermics.enpc.fr/
https://www.rocq.inria.fr/pomdapi/index.en.htm
https://who.rocq.inria.fr/Martin.Vohralik/index.html
http://www.inria.fr/en/centre/paris-rocquencourt/news/erc-consolidator-grant-for-martin-vohralik

Candidate profile

Ph.D. in numerical analysis (porous media equations, finite element and finite volume methods, Newton linearization, conjugate gradient/multigrid/domain decomposition algebraic solvers), strong publication record, programming skills (C, C++, Matlab).

Practicalities

Timing: 1,5 years, starting autumn 2015, with a possibility of prolongation up to 3 years.
Location: INRIA Paris-Rocquencourt http://www.inria.fr/en/centre/paris-rocquencourt/.
The knowledge of French language is welcome but by no means compulsory.

Application

To apply, send CV highlighting your background in numerical analysis, scientific computing, and programming, a list of peer-reviewed papers, a very brief motivation letter, and recommendation letter(s) to Martin Vohralík martin.vohralik@inria.fr.

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