SORS: Parallel quasi-Monte Carlo simulation of ultrafast carrier transport

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Talk presentation

Abstract: In this work we present scrambled low discrepancy sequences and their application in quasi-Monte Carlo methods for solving quantum-kinetic integral equations which describe the electron transport in semiconductors. Parallel versions of this application are developed for the three target HPC platforms available to us: supercomputer Blue Gene/P, HPC cluster and GPU-enabled cluster. Numerical results for parallel efficiency and computational cost are presented. In addition we discuss the coordinated use of heterogeneous HPC resources by one application in order to achieve a good performance.

Short Bio: Aneta Karaivanova is a Professor at the IICT-BAS, Sofia, Bulgaria. She holds a PhD in Computer Science since 1997. In 1999 she was awarded with the 1st prize for Computer Science research by the Bulgarian Ministry of Education and Science. Her research interests include computational mathematics and high-performance computing. She is an author of more than 80 scientific papers published in international journals and international conference proceedings. She spent more than 3 years as a guest researcher at Florida State University, USA. She had key position in many European projects and is a coordinator of various national R&D projects related to HPC, grid and GPGPU computing. Since 2011 she is the Bulgarian delegate in e-IRG.

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