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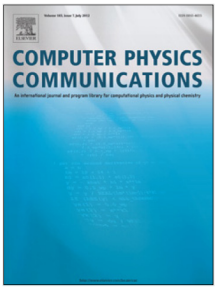

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Massively parallel data processing for quantitative total flow imaging with optical coherence microscopy and tomography☆

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Abstract

We present an application of massively parallel processing of quantitative flow measurements data acquired using spectral optical coherence microscopy (SOCM). The need for massive signal processing of these particular datasets have been a major hurdle for many applications based on SOCM. In view of this difficulty, we implemented and adapted quantitative total flow estimation algorithms on graphics processing units (GPU) and achieved a 150 fold reduction in processing time when compared to a former CPU implementation. As SOCM constitutes the microscopy counterpart to spectral optical coherence tomography (SOCT), the developed processing procedure can be applied to both imaging modalities. We present the developed DLL library integrated in MATLAB (with an example) and have included the source code for adaptations and future improvements.

Keywords: GPU data processing, CUDA, Optical coherence tomography, Flow diagnostics, Three-dimensional microscopy

Program summary

☆This paper and its associated computer program are available via the Computer Physics Communications homepage on ScienceDirect (http://www.sciencedirect.com/)

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