Kostomarov, D. P.; Zaitsev, F. S.; Suchkov, E. P.; Bogdanov, P. B. 
Solution of inverse problems by the \( \varepsilon \)-net method on high-performance computers. (English. Russian original) [Zbl 1302.82138] 

Summary: In many applications, there arises the necessity of solving ill-posed problems. Such problems play a particularly important role in the problem of controlled thermonuclear fusion (CTF), because high temperatures prevent measurements directly inside plasma.

Algorithms for parallelizing the \( \varepsilon \)-net method for solving inverse problems of plasma diagnostics involved in controlled fusion on CPU and hybrid GPGPU-based architectures are presented. Computation time, acceleration, and efficiency of these algorithms for systems based on the MPI and OpenCL technologies are estimated.

MSC:
82D75 Nuclear reactor theory; neutron transport
35R30 Inverse problems for PDEs
65Y05 Parallel numerical computation
65Y10 Numerical algorithms for specific classes of architectures
82D10 Statistical mechanics of plasmas
93B52 Feedback control

Keywords: thermonuclear fusion; plasma diagnostics; graphic accelerators (GPGPU); MPI/OpenMP; parallel computation

Full Text: DOI

References:

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