

2010 Fall
Meeting

Cite abstracts as **Author(s) (2010), Title, Abstract xxxxx-xxxx presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.**

Search Results

Your query was:

"Ng, C"

1712h

IN44A-05

[Large-scale Reduced MHD Simulations of Coronal Heating via GPGPUs](#)

***Lin, L**

lqm2@unh.edu

Space Science Center, University of New Hampshire, Durham, NH, USA

Ng, C

chung-sang.ng@gi.alaska.edu

Geophysical Institute, University of Alaska Fairbanks, Fairbanks, AK, USA

Bhattacharjee, A

amitava.bhattacharjee@unh.edu

Space Science Center, University of New Hampshire, Durham, NH, USA

In the last few years, we have performed a number of numerical simulations of a coronal heating model based on three-dimensional (3D) reduced magnetohydrodynamics (RMHD), which is generalized from our 2D model [C. S. Ng and A. Bhattacharjee, *Astrophys. J.*, 675, 899 (2008)]. In this model, random photospheric footpoint motion is applied to obtain converged average coronal heating rates and thus we require very long numerical integrations. Moreover, the formation of very fine current layers in the physical process demands runs with very high resolutions. These requirements become exceedingly difficult on conventional parallel architectures when we attempt to simulate using even higher resolutions. We present here results from a port of our RMHD code to Nvidia CUDA (Compute Unified Device Architecture) for hardware acceleration using general purpose graphics processing units (GPGPUs). The code has been benchmarked on a dedicated research workstation equipped with four Nvidia C2050 GPUs, as well as on two large-scale distributed memory machines: Lincoln/NCSA/TeraGrid and Dirac/NERSC. We will report code performance compared with the original parallel code on each of these systems, which span a variety of hardware generations/capabilities.

[1999] INFORMATICS / General or miscellaneous

[7509] SOLAR PHYSICS, ASTROPHYSICS, AND ASTRONOMY /

Corona

Earth and Space Science Informatics (IN)

2010 Fall Meeting

[New Search](#)

[AGU Home](#)