Fig. 2. 2D mantle convection at a Rayleigh number of 10^9.

highly-optimized CUBLAS routines, allowing us to unlock a significant fraction of GPU's performance. This performance has enabled us to study the behavior of high Rayleigh number simulations, on the order of 10^9, in 2D and 10^7 in 3D over sufficient time scales to see evidence of flow-reversal (Fig. 1).

We compare our CUDA code's performance with Jacket-accelerated Matlab code and CPU-only Matlab code across the Tesla C1060, Tesla C2050, and GTX 480 (Fig. 2).

Observation and analysis of ULF data associated with M_b=4.5 Koyna-Warna (India) earthquake

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In recent years ULF (Ultra Low Frequency) emission is detected during the seismic activity and this emission is recognized as one of the most promising candidate for earthquake prediction. In this paper, we present measurements of magnetic field anomalies detected for moderate earthquake that occurred on 29 July, 2008 having magnitude (M_b) 4.5. The ULF observation system uses three-component induction coil magnetometer and it has been installed at Shivaji University Kolhapur (16.40°N, 74.15°E), India.

Data of moderate earthquake have been analyzed using spectral density and polarization methods [Hattori et al., 2002a, b]. Long term data analysis shows that, two anomalous enhancements in intensity of magnetic field were observed about two and one months before the earthquake. Short term data analysis shows that, maximum enhancement in intensity of magnetic field was prominent within ±1 hours around the main shock time and it started to be observe four to five days before the earthquake. The enhancement in intensity of magnetic field is examined in terms of space magnetic pulsation and ULF emission associated with earthquake by using polarization parameter [Hayakawa et al., 2007; Sharma et al., 2008] and planetary index (K_p). It is concluded that there is no relation between enhancements in intensity of magnetic field and geomagnetic activity.

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