[JJ] Evening Poster | H (Human Geosciences) | H-DS Disaster geosciences

[H-DS10]Tsunami and Tsunami Forecast

convener:Naotaka YAMAMOTO CHIKASADA(National Research Institute for Earth Science and Disaster Resilience), Kentaro Imai(Japan Agency for Marine-Earth Science and Technology), Hiroaki Tsushima(気象 庁気象研究所)

Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe) This session discusses issues related to improving real-time and long-term prediction accuracy of tsunami from earthquakes, landslides, and volcanoes, which include such as a better understanding of tsunami dynamics, new real-time tsunami observing systems deployed in the open ocean and coastal waters, methodologies of more rapid and accurate prediction during tsunami emergencies, more extensive and accurate inundation maps, and long-term tsunami potential forecast.

[HDS10-P16]Tsunami inundation simulation by GPU computing and its application to tsunami forecast

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Keywords:Tsunami, Inundation, Numerical simulation, GPU

Numerical simulation is effective approach together with stable observation for tsunami forecast, however inundation simulation usually requires high computational cost. We are developing a numerical simulation code by the Compute Unified Device Architecture (CUDA) programming to conduct tsunami propagation and inundation simulation using a Graphics Processing Unit (GPU). The simulation code was optimized on TSUBAME3.0 operated by the Tokyo Institute of Technology. It takes two hours to compute 6 hours of tsunami for the tsunami inundation database of the forecast system developed by the NIED (e.g. Aoi et al. 2015JpGU). The computation area of 1600km by 3000km was represented by ununiformed grid applying nesting method and the minimum grid size was 10 m to compute inundation. We estimated the computational cost of the GPU and CPU computing. The GPU computing is approximate 20 times faster than the computing based on CPU. Numerical simulation using GPU computing would be effective to research tsunami forecasting based on numerical modeling with high computing cost, for example, construction of tsunami inundation database and real-time simulation after tsunami generation. Acknowledgements: This work is supported by " Joint Usage/Research Center for Interdisciplinary Large-scale Information Infrastructures" in Japan (Project ID: jh170035-NAJ). This work was also supported by Council for Science, Technology and Innovation (CSTI), Cross-ministerial Strategic Innovation Promotion Program (SIP), &Idquo;Enhancement of societal resiliency against natural disasters" (Funding agency: JST).