



Leibniz-Rechenzentrum
der Bayerischen Akademie der Wissenschaften



Advance Visualisation and Urgent Computing

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Video: **SuperMUC** rendered on SuperMUC by LRZ

<http://youtu.be/OIAS6iiqWrQ>

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Prof. Michael Bader, Department of Informatics (TUM)

1,42 Petaflop/s on 147.456 Cores of SuperMUC
(44,5 % of Peak Performance)

http://www.uni-muenchen.de/informationen_fuer/presse/presseinformationen/2014/pelties_seisol.html

- Introduction
 - Virtual Reality and Visualisation Centre (V2C) @ LRZ
 - Urgent Computing
- Problem & Motivation
- Proof of Concept
- Obstacle & Future Work
- References



- V2C – Inaugurated in autumn 2012
 - 5 sided projects installation
 - Large screen Powerwall with Quad Full High Definition
- Immersive projection technology
 - Large complex datasets can be stereoscopically displayed
 - Intuitive explorations

■ Definition

- Urgent computing requires computations to **commence in short order** and **complete within a stipulated deadline** so as to support **mitigation** activities in preparation, response and recovery from an event that requires **immediate** attention [3]

■ Urgent events can include

- Earthquake
- Tsunami
- Flashflood
- Storm
- Forest fire
- Landslide

- Decision making has to take place swiftly due to urgency of events
- Late decisions can mean no mitigation activities are possible

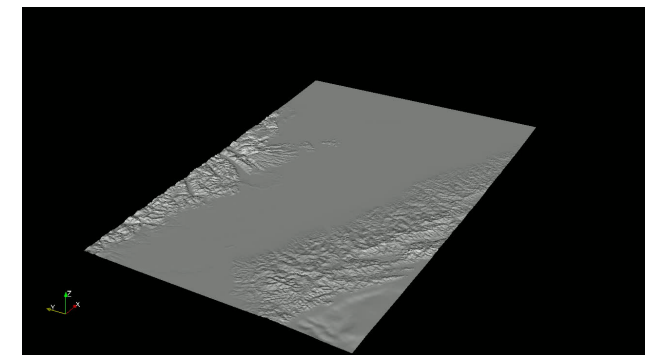
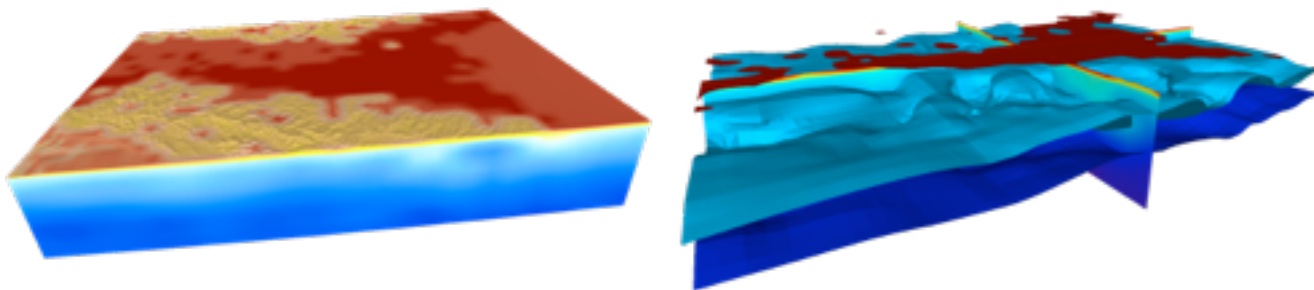
2013 Deutschland - 15 billion EUR



2011 Japan - 273 billion EUR



- Leverage on the 5 sided projection installation to enable decision makers to have a swift and yet deep insight into simulated predictions



Credits:
VERCE.eu

- Date: 20 May 2012
- Magnitude: 5.9
- Code: Specfem3D Cartesian



- Existing urgent computing definitions are usage context specific
 - Difficulty to identify urgent computing use cases
- Absence of a widely adopted data/file format and visualisation software

- Refine urgent computing definition for general applications
- A framework that will enable urgent computing use cases to use generic e-Infrastructure

- [1] S. H. Leong, A. Frank, and D. Kranzlmüller, Leveraging e-infrastructures for urgent computing, International Conference on Computational Science (ICCS 2013) (V. Alexandrov, M. Lees, V. Krzhizhanovskaya, J. Dongarra, and P.M.A. Sloot, eds.), Procedia ComputerScience, vol. 18, Elsevier, 2013, pp. 2177 – 2186.
- [2] E. Pajorová, L. Hluchý, and C. Anthes, 3d geovisualization service for grid-oriented applications of natural disasters, 16th International Conference in Central Europe on Computer Graphics, Visualization and Computer Vision - Poster Proceedings (WSCG '08) (Plzen, Czech Republic), February 2008, pp. 1–4.
- [3] S. H. Leong and D. Kranzlmüller. Towards a general definition of urgent computing. Submitted.
- [4] Leibniz Supercomputing Centre. Virtual Reality and Visualisation, January 2015. http://www.lrz.de/services/v2c_en/.
- [5] Virtual Earthquake and seismology Research Community in Europe e-science environment. VERCE, January 2015. <http://www.verce.eu/>.