

# Visual Data Mining for Seismic Data Analysis Using Super High Definition Image towards Petascale Computational Science



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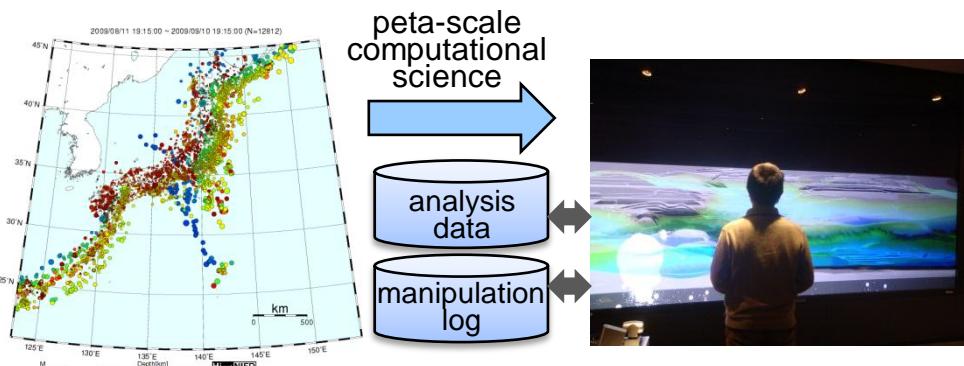
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## ■ Purpose of This Study

- This study aims at constructing the framework of analyzing large scale data based on visual data mining, automatic tuning, and distributed data management technologies towards **petascale computational science**.
- Especially, prototype of **seismic data analysis** environment is developed to analyze earthquake phenomenon by using super high definition visual data mining and data assimilation technologies.

## ■ ViNDAM Project

Concept of **ViNDAM project** (Visual Numeric Data Application Management)



- Data analysis using 2D image by manual manipulation

- Data analysis using super high definition visual data mining
- Reproducibility of data analysis using log data

## ■ Elemental Technology

### 1) Visual data mining

Visualization of large amount of data by changing parameters interactively using super high-definition stereo display.

### 2) Automatic manipulation

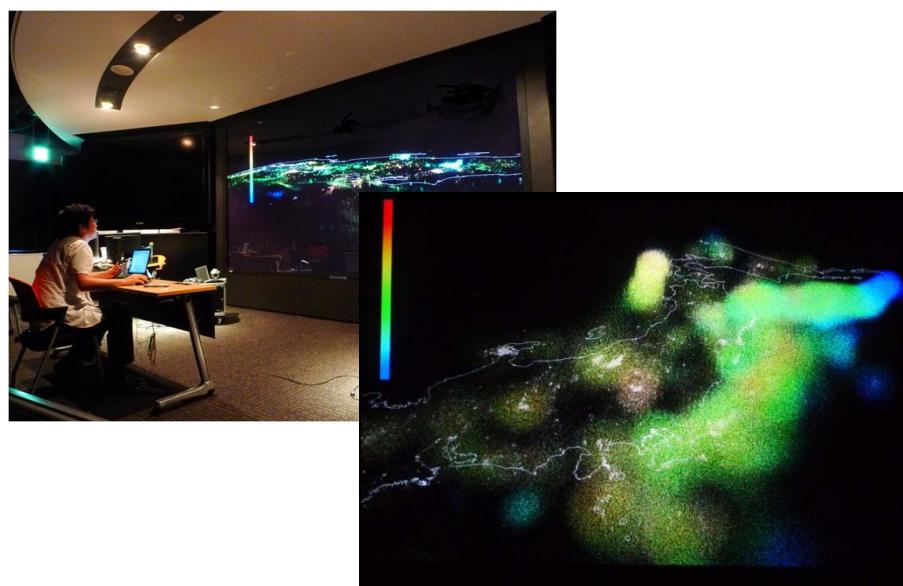
Data assimilation between measurement data and numerical simulation data by using automatic tuning technology.

### 3) Data management

Management of large amount of analysis data and log data using distributed database.

## ■ Super High Definition Visual Data Mining

- Prototype of **super high definition visual data mining** environment using 4K stereo display was developed to analyze seismic data.
- Hypocenter data that contains location, magnitude, and occurrence time, and statistical data such as b-value can be visualized interactively by changing various parameters in the three-dimensional virtual space.



## ■ Data assimilation

Numerical simulation data can be assimilated into observation data by using **automatic parameter tuning**.

