

Research Overview

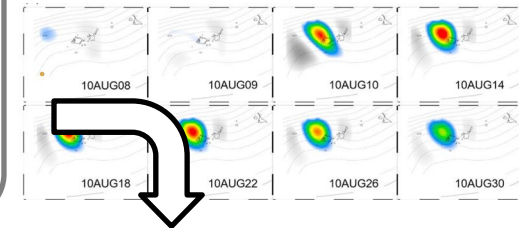
Fault slip analysis based on geodetic data

Present: Fault slip analysis using state space modeling

Issues: Detection of deformation phenomena (Topic A)

Handling of observation noise (Topic B)

Short-term prediction (Topic C)



Improvement of deformation detectability based on statistics and machine learning

- Noise separation using decomposition analysis
- Objective detection of deformation by sparse estimation and deep learning

Refinement of state space modeling with considering characteristics of observation noise

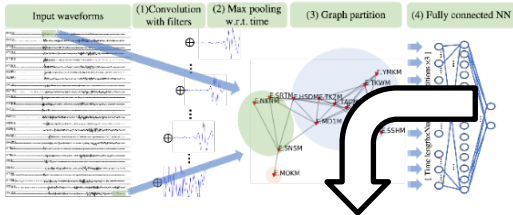
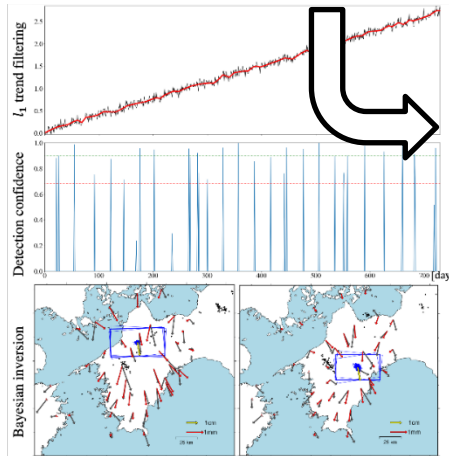
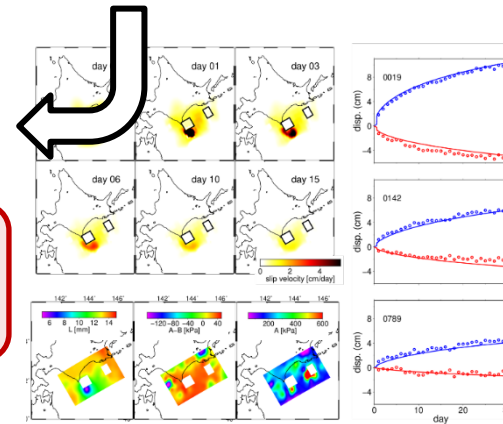
- Straightforward modeling of observation noise
- Conversion of feature values of observation by machine learning

Methodology based on deepening of the knowledge about noise characteristics

Data assimilation fault-slip monitoring system

- Short-term prediction of fault slip using data assimilation
- Validation with geodetic data around Nankai region

Real-time monitoring and short-term prediction of fault slip by automated data analysis and system operation



Project Members

Name	Institution	Research Topic in the Project
Masayuki Kano	Tohoku University	Data assimilation
Yo Fukushima	Tohoku University	InSAR analysis
Yusuke Tanaka	Tohoku University	GNSS analysis
Yutaro Okada	Tohoku University	InSAR & GNSS data analysis
Rikuto Fukushima	Tohoku University	Physics-informed neural networks
Keisuke Yano	ISM	Development of statistical method
Shin'ichi Miyazaki	Kyoto University	GNSS analysis
Hiroataka Hachiya	Wakayama University	Development of statistical method
Takuya Nishimura	Kyoto University	GNSS analysis
Takane Hori	JAMSTEC	Numerical simulation
Ryoko Nakata	University of Tokyo	Numerical simulation

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