

## Keynote speaker Topic 2

### Professor Shinji Toda

#### Profile

International Research Institute of Disaster Science,  
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Date of Birth: 10 December 1966  
Nationality: Japanese



#### Titles

2012-2014: A board member of the Japanese Society for Active Fault Studies  
2012-2014: An editor-in-chief of the Active Fault Research  
2005-present: A committee member, Evaluations of Active Faults for the Headquarters for Earthquake Research Promotion  
2010-2012: A member of expert committee for earthquake and tsunami evaluation, Nuclear and Industrial Safety Agency

#### Position Held

2012-present: Professor of the International Research Institute of Disaster Science, Tohoku University  
2009-2012: Associate Professor of the Disaster Prevention Research Institute, Kyoto University  
2001-2009: Researcher of the Active Fault Research Center, Geological Survey of Japan, AIST  
1999-2001: Assistant Professor of the Earthquake Research Institute, University of Tokyo  
1991-1999: Researcher of the Central Research Institute of Electric Power Industry  
1996-1997: Visiting Scientist at the US Geological Survey, Menlo Park  
2005-2009: Visiting Professor of the Institute of Statistical Mathematics

#### Research Interests

1996-present: Earthquake triggering and fault interaction  
1998-present: Seismicity, seismo-tectonics and seismic hazard assessment  
1991-present: Paleoseismology and earthquake geology

#### Education

Dr. of Science (Tohoku University, 1999)  
M.S., Tohoku University, 1991  
B.S., Kagoshima University, 1989

### Abstract

#### Seismic and displacement hazard assessments on active faults in Japan

Here I briefly review 20-yr progress in active fault study in Japan and raise several new issues. In terms of seismic hazard assessment, the Headquarters of Earthquake Research Promotion successfully published the first probabilistic national seismic hazard map in 2005 based on the recent intensive surveys on the major active faults. The hazard map is roughly consistent with the historical intensity distribution affected by the shortly repeated subduction zone earthquakes. However, underestimates and unpredictability occurred in land areas due to unmapped blind faults. In contrast, overestimates for a large fault system might be another issue (e.g., 2014 Nagano-ken-hokubu earthquake of M6.7 on the Itoigawa-Shizuoka Tectonic Line). Surface displacement is the other aspect of hazard on active faulting. Recent development of remote sensing techniques demonstrates that the surface ruptures not only occurred along the pre-existing mapped scarps but also involved numerous distributed faults away from the main rupture zone. It requires further study of probabilistic fault displacement hazard analysis for strict assessment such as nuclear safety.

**Keywords:** seismic hazard map, fault segmentation, blind fault, rupture complexity