



## CEE691 Graduate Seminars in Civil Engineering

# Using GPS Buoys in the Nankai Trough and Tsunami Modeling to Avoid Underestimation of Tsunami Warning

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**About the speaker:** Shuji Seto is currently a Ph.D student in the Hydrosphere Disaster Laboratory, Graduate School of Safety Science Kansai University. He is an expert in minimizing disasters associated with tsunami. Shuji's primary research interests are simulating multiple tsunami scenarios accounting for uncertainty of seismic magnitude, hypocenter, large slip zones and super large slip zones related to asperity, numerical analysis of tsunami propagation, detecting tsunami by oceanographic radars, and improving information associated with tsunami disasters by using observational data. He received his master from Kansai University in March 2014.

### Abstract

The Tohoku Earthquake with Mw 9.0 occurred in 2011 and its tsunami attacked Japan. Unfortunately, the tsunami warning issued by the Japan Meteorological Agency (JMA) was underestimated. The JMA updated the warning immediately by using tsunami waveform observed by the GPS-mounted Buoys. Takahashi and Konuma (2007) pointed out that the present tsunami warning system would be underestimated for huge earthquakes with Mw of around 9.0. Seto et al. (2013) carried out a numerical experiment for more than a thousand tsunami sources in the Nankai Trough and examined sensitivity of the GPS-mounted Buoys for detecting tsunami sources. However, they assumed tsunami sources are based on the homogeneous fault model only. In this study, 18675 tsunami sources were assumed in the Nankai Trough based on the seismology as the initial condition, which contains the heterogeneous and homogeneous fault models. Finally, a model is proposed to estimate the magnitudes of earthquakes and to prevent the underestimation of tsunami warning by using GPS-mounted Buoys.

