

21 COE (EASTEC) / AOB Seminar on Tsunami Forecasting and Numerical Modeling

Date and Time: 10:00-12:00 17 October 2006

Place: Conference Room 1, Research Center for Prediction of Earthquakes and Volcanic Eruptions Tohoku University

" Application of Cabled Offshore Ocean Bottom Tsunami Gauge Data for Real-Time Tsunami Forecasting "

1. 10:00~10:30

Mr. Hiroaki Tsushima (Mc course student, Graduate School of Science, Tohoku University)



Abstract: Today, near-field tsunami warning is based only on the seismic data and therefore has some problems; no one can assess the validity of the forecasting until tsunami reaches coasts and tsunami amplitudes may be underestimated for the case of "tsunami earthquakes". To avoid these problems, we develop an algorithm for real-time tsunami forecasting based on cabled offshore ocean bottom tsunami gauge data, because the offshore stations can detect a tsunami earlier than it reaches to the coastal area. Especially, we focus on near-field tsunamis generated by earthquakes occurring along the Kuril and the Japan Trench subduction zones. My talk will summarize the algorithm and a result of a numerical test assuming the 1896 Sanriku tsunami earthquake ($M_s=7.2$, $M_t=8.2$).

" Tsunami Hazards from Potential Earthquakes along South China Sea Coast "

2. 10:30~11:00

Ms. Yingchun Liu (Dc course student, South China Sea Institute of Oceanology, Chinese Academy of Sciences)

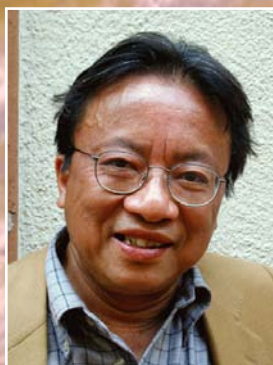


Abstract: The recent Indonesian earthquake has awakened great concerns about destructive hazards along the East China coast. My talk will assess the probability for tsunami waves coming from large earthquakes in the neighboring subducting plate boundaries to hit the Chinese coast in the next century. There are twelve large historical earthquakes ($M > 6$) near the studied coastal area (12-23 N). The probabilities of earthquakes in the South China Sea are computed by the local G-R relationship. Our forecast is that there is 3 % probability for a ten foot tsunami wave to hit Hong Kong and Macau within the next 100 years.

" Earthquake Instabilities from Thermo-mechanical Feedback of Crustal-mantle System "

3. 11:00~12:00

Prof. David A. Yuen (Professor of Geophysics, Supercomputing Institute University of Minnesota)



Abstract: There are two types of instabilities which must be considered in any consideration of earthquake instabilities involving the crust and mantle. The first is the brittle-ductile viscoelastic instabilities which involve crustal rheology, such as quartz. The second is the ductile instabilities which involve mantle rheology, like olivine. In this study we show the critical importance to include crustal rheological parameters in any thermo-mechanical interaction in the coupled crustal-lithosphere system. Timescales of a few days are possible when these couplings are taken into account. In sum, we have a single rheological model which can account for multiple timescales ranging from tectonic events to earthquake instabilities with short duration of time.