Geophysical Research Abstracts
Vol. 14, EGU2012-4200, 2012
EGU General Assembly 2012

Title: Dispersive tsunamis; does it really matter?

G. K. Pedersen (1,2), F. Løvholt (1,3), S. Glimsdal (1,3), C. B. Harbitz (1,3)

(1) International Centre for Geohazards (ICG), Oslo, Norway, (2) University of Oslo, Dept. of Math., Oslo, Norway, (3) Norwegian Geotechnical Institue, Oslo, Norway

Most tsunami modelers rely on the shallow water equations for predictions of propagation and runup, either by using one of the standard codes or by means of an in-house code. Some groups, on the other hand, insist on applying dispersive wave models, sometimes even with enhanced nonlinear properties. Dispersive models are also available as standard code, free or commercial, and some of these are fairly well suited for implementation of tsunami applications.

Whereas the employment of dispersive codes for tsunami computation certainly boost the CPU times and memory requirements the gains are regarded as more uncertain by many in the tsunami community. It is clear that physical effects like frequency dispersion and formation of undular bores are beyond the shallow water theory.

In this talk we draw on the experience from a series of earthquake and landslide tsunamis to address the significance of dispersion. While frequency dispersion is generally important for tsunamis generated by both submarine and subaerial landslides, the effect is apparent also for tsunamis of seismic origin, albeit to a lesser extent. The source dimensions, water depth and propagation distance all combine to determine the effect of dispersion in deep water propagation. Undular bores do also evolve under given conditions. However, their effect on inundation is still uncertain.