ID: **O5.2-076** Type: **Oral**

Towards a Real Time Early Tsunami Warning System by Acoustic Gravity Wave Theory

Wednesday, June 21, 2023 1:30 PM (15 minutes)

Tsunamis have a long history of devastation, causing more than 250,000 deaths worldwide during the last two decades. Current rapid warning systems rely on the earthquake magnitude mainly resulting in over three-quarter of alarms being false. Aiming at reducing false alarms we have developed a complementary real time early tsunami warning system methodology. The methodology is based on analysing acoustic signals under the effects of gravity, known as acoustic gravity waves (AGWs), that are generated together with the tsunami. The signals travel at the speed of sound in the medium which far exceeds the maximum phase speed of the tsunami. AGWs carry information about the source which is recorded by remote hydrophones (underwater microphones). Analysing these recordings in real time, requires solving both the inverse and direct problems, which are the main strength behind the proposed warning methodology. In addition, we use machine learning to classify the type of earthquake mode of strike. In this talk I shall discuss various AGW theories and applications, both fundamental and applied, and how analysing CTBTO hydrophone data contributed to the development of new mathematical models. Attention will be focused on the real time early tsunami warning system methodology that has been further developed into an operational software.

E-mail

kadriu@cardiff.ac.uk

Promotional text

We developed a complementary operational software for a reliable real-time early tsunami warning that can reduce false alarms significantly. The software can be deployed in National Warning Centres supporting the national need of over 700 million people under tsunami risk areas.

Oral preference format

in-person

Primary author: KADRI, Usama (Cardiff University)

Co-authors: Mr ABDOLALI, Ali; Mr FILIMONOV, Maxim (Cardiff University)

Presenter: KADRI, Usama (Cardiff University)

Session Classification: O5.2 Synergies with Global Challenges

Track Classification: Theme 5. CTBT in a Global Context: T5.2 Synergies with Global Challenges