ABSTRACT

Underwater seismic events generate acoustic radiation (such as acoustic-gravity waves), that carries information about the source and can travel long distances before dissipating. Effective early warning, emergency response, and information dissemination for earthquakes and tsunamis require a rapid characterization of the fault properties: geometry and dynamics.

In this work, we analyzed hydrophone recordings of 201 earthquakes, located in the Pacific and the Indian Ocean, by employing acoustic signal processing and classification methods. The analysis allows identifying the type of earthquake (i.e. slip type, magnitude) and provides near real- time estimation of the effective properties of the fault dynamics and geometry unfortunately, classifying tsunami-induced building damage into detailed damage classes remains a challenge.

The purpose of this paper is to present a novel multiclass classification model that considers a high-dimensional feature space derived from several sizes of pixel windows and to provide guidance on how to define a multiclass classification scheme fordetecting tsunami-induced damage.

The proposed model uses a Multi class support vector machine (M-SVM) to determine the parameters of the discriminant function. The generalization ability of the model was tested onEarthquake and Tsunami