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Tsunami modelling on lake scales - a sensitivity analysis

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When simulating tsunamis, one of the major questions that arises in the coastal community is whether a certain set of equations is adequate to predict the behavior of generated waves and their effective impact on the shoreline. This aspect has been analyzed in several studies during the past decades in the context of ocean scales, focusing, for example, on the 2004 Sumatra and 2011 Tohoku events.

Investigations concerning lake scales, which appear to be very different from ocean ones, have not been considered in-depth yet, to the authors' knowledge. Nevertheless, the urge to have ready-to-use tools to allow a prediction of possible hazardous events due to tsunamis in lakes has grown in the past decades (e.g. Laguna Palcacocha, Peru), especially due to climate warming that tends to enhance slope instabilities.

This contribution provides a sensitivity analysis on lake scales, considering different typologies of modeling equations and softwares. The goal is to allow for an overview and a quantification of possible errors that might occur for specific choices of modeling equations. This study is part of an ongoing project that aims at investigating the workflow of the processes linked with the tsunami hazard of lakes, triggered by submerged and subaerial landslides.