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Multiphase computational study of water waves generated by a rapid mass movement of low density

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Barrier lakes, devoted to the production of snow, are most of the time located in the immediate vicinity of steep slope terrain and are submitted to snow avalanche impacts. If safe locations are not available, it is required to quantify the effects of the impact of snow avalanches into the lake in order to determine the required freeboard to assess the dam overflow. Due to low density ratio between snow and water, the use of available scaling laws, valid only for a high density ratio such as landslide and debris flows, induce an over estimation of the wave magnitude. In this research a multiphase numerical simulations, using a computational fluid dynamics models, are conducted to investigate the nature and the magnitude of the wave generated by a low density rapid movement in a lake. The objective of this study is to extrapolate the existing scaling laws to the low density ratio domain.