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Observations and simulations of internal solitary wavetrains generated by frontally forced intrusions

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The intrusion resulting from a frontal collision of two stratified water masses has recently been described as a potential source of generation of internal solitary wavetrains (ISW). However, only a handful of field observations have been reported such that the relationships between the properties of the generated ISW (wavelength, amplitude, energy), and the background and forcing conditions (surface layer thickness, shearing, Richardson and Froude number) are misunderstood. To assess this issue, idealized numerical simulations are carried out using a 2D nonlinear and nonhydrostatic model. The objective is to determine empirical relationships between ISW properties and the control condition by exploring the wide parameter space involved in this mechanism. Here we report the results of these numerical simulations and few observations collected during the last two summers in the Saguenay Fjord (Quebec Canada).