The response of a basin scale seiche due to variation of the aspect ratio of the density surface ANDREW GRACE[1], MAREK STASTNA, FRANCIS POULIN, University of Waterloo — Experimental analysis of the relaxation of a tilted density interface by Horn et.al. showed how mechanisms such as Kelvin–Helmholtz Billows and the formation of solitons affect the degeneration of a basin scale seiche. The emergence of the different degenerative mechanisms were found by varying the thermocline depth and seiche amplitude/layer thickness ratio. The study found that the parameter space can be divided into five regimes where different mechanisms dominate the motion and the subsequent degeneration of the seiche. However, this study neglected the dependence of the degeneration mechanisms on the amplitude to length ratio (aspect ratio) of the seiche. Through the use of high resolution pseudospectral simulations of the stratified, incompressible Navier–Stokes Equations under the Boussinesq approximation we investigate how the primary degenerative mechanism of the seiche changes when the aspect ratio of the initial condition is varied. We have found that there is clear difference in the dominant degeneration mechanism of the seiche when the aspect ratio becomes small enough. We found with large aspect ratios, the dominant degeneration mechanism appears to be due to shear while at smaller aspect ratios the dominant mechanism is due to the formation of dispersive waves.

[1]Membership Pending

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