Geophysical Research Abstracts
Vol. 18, EGU2016-68, 2016
EGU General Assembly 2016

Viscous Boussinesq equations for internal waves

Chi-Min Liu
Chienkuo Technology University, General Education Center, Changhua City, Taiwan (cmliu@ctu.edu.tw)

In this poster, Boussinesq wave equations for internal wave propagation in a two-fluid system bounded by two impermeable plates are derived and analyzed. Using the perturbation method as well as the Padé approximation, a set of three equations accurate up to the fourth order are derived and displayed by three unknowns: the interfacial elevation, upper and lower velocity potentials at arbitrary vertical positions. No limitation on nonlinearity is made while weakly dispersive effects are originally considered in the derivation. The derived equations are examined by comparing its dispersion relation with those of existing models to verify the accuracy. The results show that present model equations provide an excellent base for simulating internal waves not only in shallower configuration but also medium configuration.