**A Finite Element-Volume Method for the Serre Equations**

Inundation from water wave hazards such as tsunamis and storm surges poses significant risks to many of our coastal communities. The most efficient method for modelling these hazards and therefore their associated risk is through numerical simulation. Most large scale simulations of tsunamis and storm surges; such as the collaborative effort ANUGA, rely on the Shallow Water Wave equations where wave behaviour is primarily determined by nonlinear effects. Recent research has demonstrated that dispersion is also important for the evolution of tsunamis. Therefore, there is a need to develop numerical methods for dispersive equations, such as the Serre equations. Building upon the previous work at the ANU, which developed a hybrid finite volume and finite difference method to solve the Serre equations I have developed an alternative numerical method that combines a finite element and a finite volume method to solve the Serre equations. The developed method has a number of desirable properties; it conserves all the conserved quantities associated with the Serre equations and it is robust. Linear analysis demonstrated that this method was convergent and possessed good dispersion properties. Finally the method was validated against analytic solutions, forced solutions and experimental results.