**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 and accurate 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 nonlinearity. Recent research has demonstrated the importance of dispersion for the evolution of tsunamis, demonstrating 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 finite volume method for the Serre equations I have developed a 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 the conserved quantities of the Serre equations and it is robust. This method was demonstrated to be convergent for the linearised Serre equations, and its dispersion error was determined. It was also validated against analytic solutions, forced solutions and experimental results.