CHAPTER 5 CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Three different types of wave propagation have been simulated in the framework of 1D SWE using the Preissmann implicit scheme. Based on those simulation results, it can be concluded that:

1. The Preissmann implicit scheme has successfully solved the SWE, proven by the numerical result of all simulations although there is still inaccuracy in the solitary wave case due to the absence of the non-hydrostatic term.
2. For tidal wave simulation, of which the dispersion effect is negligible, the numerical Preissmann implicit scheme was proven to be robust and accurate in predicting both water elevation and velocity.
3. In the scope of modeling the periodic permanent roll wave, where the dispersion effect might be argued to play a considerable role, the result from numerical model is still in agreement although the Preissmann implicit scheme overestimated the wave peak.
4. For the solitary wave simulation, both the wave peak and the occurrence positions were underestimated by the Preissmann implicit scheme. The greater the amplitude, the greater the dispersion effect, thus, the numerical model became less accurate.

5.2 Recommendation

The recommendations for the future study are:

1. There are still inaccuracies, particularly for the simulation of solitary waves, in which the dispersion effect is relatively large, therefore, the addition of non-hydrostatic term into the numerical Preissmann scheme becomes necessary in the future study. By adding the non-hydrostatic term, the vertical velocity distribution is no longer uniform, and the dispersion effect is taken into account, thus, the result from numerical model becomes more accurate and in accordance with the analytical result.
2. For the periodic roll waves, it would be interesting to investigate the simulation using SWE model with Preissmann scheme including the turbulence terms.

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