

Outline of Modelling 3D turbulent floods based on the Smagorinski large eddy closure

Meng Cao

July 6, 2012

Bellow is the outline for the work of Modelling 3D turbulent floods based on the Smagorinski large eddy closure.

1 Introduction

Describe conventional depth-averaged turbulence models briefly or introduce the low order governing equations of the proposed turbulent modelling?

2 The description of the turbulent modelling

- Governing partial differential equations
- Smagorinski large eddy closure
- Boundary conditions

3 Center manifold theory supports the modelling

Is it necessary to mention the Center manifold theory? Since it was described in the work of [Roberts et al. \(2008\)](#) and [Georgiev et al. \(2008\)](#).

4 Modelling turbulent flows in straight and meandering open channels

Use the model simulate turbulence flows in straight and meandering open channels. Compare the results with relevant published work (Bousmar 2002, Liu et al. 2009, e.g.).

5 Conclusion

References

- Bousmar, D. (2002), Flow modelling in compound channels: momentum transfer between main channel and prismatic and non-prismatic floodplains, PhD thesis, Universit  Catholique de Louvain.
- Georgiev, D. J., Roberts, A. J. & Strunin, D. V. (2008), ‘Modelling turbulent flow from dam break using slow manifold’, *ANZIAM J.* 50 pp. 1033–1051. <http://anziamj.austms.org.au/ojs/index.php/ANZIAMJ/article/viewFile/1466/1264>.
- Liu, H., Zhou, G. J. & Burrows, R. (2009), ‘Lattice boltzmann model for shallow water flows in curved and meandering channels’, *International Journal of Computational Fluid Dynamics* **23**, 209–220. [doi:10.1080/10618560902754924](https://doi.org/10.1080/10618560902754924).
- Roberts, A. J., Georgiev, D. J. & Strunin, D. V. (2008), Model turbulent floods with the Smagorinsky large eddy closure, Technical report. <http://arxiv.org/abs/0805.3192>.