

References

- [1] J. F. Douglas, J. M. Gasiorek, and J. A. Swaffield. *Fluid Mechanics*. Pitman, 1979.
- [2] P. G. Drazin and W. H. Reid. *Hydrodynamic Stability*. Cambridge, 1982.
- [3] H. P. Langtangen. *Finite Difference Computing with Exponential Decay Models*. Springer, 2016. <http://tinyurl.com/nclmcng/web>.
- [4] H. P. Langtangen. *A Primer on Scientific Programming with Python*. Texts in Computational Science and Engineering. Springer, fifth edition, 2016.
- [5] H. P. Langtangen and A. E. Johansen. The Parampool tutorial. <http://hplgit.github.io/parampool/doc/web/index.html>.
- [6] H. P. Langtangen and A. E. Johansen. Using web frameworks for scientific applications. <http://hplgit.github.io/web4sciapps/doc/web/index.html>.
- [7] H. P. Langtangen and S. Linge. *Finite Difference Computing with Partial Differential Equations*. 2016. <http://tinyurl.com/Langtangen-Linge-FDM-book>.
- [8] J. D. Logan. *Applied Mathematics: A Contemporary Approach*. Wiley, 1987.
- [9] D. J. Tritton. *Physical Fluid Dynamics*. Van Nostrand Reinhold, 1977.

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