Chapter 1

oomph-lib related Publications

Here is a list of publications resulting from (or produced with) oomph-lib. If you have produced any work with oomph-lib and would like it to be listed here, send us a URL (or an electronic version of the publication) and we will install a link to it.

1.1 Talks

- M. Heil & A. L. Hazel (2008) "Everything you always wanted to know about \c oomph-lib but were afraid to ask". Seminar given at various UK universities. (pdf).

- M. Heil, A.L. Hazel, R. Muddle & J. Boyle (2007) "Large-Displacement FSI problems: Segregated vs. monolithic solvers in \c oomph-lib". Oberwolfach Mini-Workshop: Theory and Numerics of Fluid-Solid Interaction. (pdf). [signficantly extended version of Ibiza talk including a much larger number of test cases.]

- M. Heil, A.L. Hazel, R. Muddle & J. Boyle (2007) "Large-Displacement FSI problems: Segregated vs. monolithic solvers in \c oomph-lib". Coupled Problems 2007, Ibiza, Spain. (pdf).

- M. Heil & A. L. Hazel (2006) "An object-oriented approach to the evaluation of the 'shape derivatives' in monolithic fluid-structure interaction solvers." 7th World Congress on Computational Mechanics, LA, July 2006. <A HREF="http://www.maths.man.ac.uk/~mheil/oomph_lib_additional_material/LA_talk_2006/LA_talk.pdf">(pdf).</A> Here's the associated animation <A HREF="http://www.maths.man.ac.uk/~mheil/oomph_lib_additional_material/LA_talk_2006/fsi.avi">(avi).

- Iason Papaioannou & Orkun Oezkan Doenmez, supervised by Stefan Kollmannsberger (2006) "-Learning object-oriented programming in the context of using a multi-physics finite element library." Lehrstuhl fur Bauinformation, TU Munich (pdf) (ppt). Here are the associated animations (avi files) of the velocity and pressure fields for the unsteady flow past a circular cylinder.

- M. Heil & A. L. Hazel (2005) "oomph-lib – An *O*bject-*O*riented *M*ulti-*Ph*ysics Finite-Element *Lib*rary." Workshop on Fluid-Structure Interaction. Hohenwart, Germany. <A HREF="http://www.maths.man.ac.uk/~mheil/oomph_lib_additional_material/Hohenwart_talk_2005/Hohenwart_2005.pdf">(pdf).

- M. Heil, S.L. Waters & A. L. Hazel (2005) Transverse flows in rapidly oscillating cylindrical vessels. ASME Summer Bioengineering Conference, Vail, Colorado, June 2005. (pdf).

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1.2 Papers

- de Lózar, A., Juel, A. & Hazel, A. L. (2008) The steady propagation of an air finger into a rectangular tube. Journal of Fluid Mechanics **614**, pp 173–195. Link to electronic journal
- Hazel, A.L. & Heil, M. (2008) The influence of gravity on the steady propagation of a semi-infinite bubble into a flexible channel. Physics of Fluids **20**, 092109. (abstract) (pdf preprint)
- Heil, M., Hazel, A.L. & Boyle, J. (2008): Solvers for large-displacement fluid-structure interaction problems: Segregated vs. monolithic approaches. Computational Mechanics. (journal link)
- Heil, M. & Waters, S.L. (2008) How rapidly oscillating collapsible tubes extract energy from a mean flow. Journal of Fluid Mechanics **601**, 199-227. (journal link).
- Hewitt, R. E. & Hazel, A. L. (2006) Midplane-symmetry breaking in the flow between two counter-rotating disks. *Journal of Engineering Mathematics* **DOI: 10.1007/s10665-006-9098-2**. (journal link)
- Heil, M. & Hazel, A. L. (2006) oomph-lib – An *O*bject-*O*riented *M*ulti-*Ph*ysics Finite-Element *Lib*rary. In: *Fluid-Structure Interaction*, Editors: M. Schafer und H.-J. Bungartz. Springer (Lecture Notes on Computational Science and Engineering), pp 19–49. (abstract) (pdf preprint)
- Heil, M. & Waters, S.L. (2006) Transverse flows in rapidly oscillating, elastic cylindrical shells. *Journal of Fluid Mechanics* **547**, 185-214. (abstract) (pdf preprint)
- Jensen, O.E. & Heil, M. (2003) High-frequency self-excited oscillations in a collapsible-channel flow. *Journal of Fluid Mechanics* **481** 235-268. (pdf preprint) (abstract)

  The computations shown in this paper were performed in the days before oomph-lib, but the problem considered in this study now features in oomph-lib demo problems:

  – Flow in a 2D channel with an oscillating wall.
  – Flow in a 2D collapsible channel.

1.3 Theses

- Nick Chapman (2006) "Unstructured triangular/tetrahedral mesh generation". MSc in Theoretical and Applied Fluid Dynamics, University of Manchester.
- Chris Gold (2006) "Explicit Timestepping in oomph-lib". MSc in Theoretical and Applied Fluid Dynamics, University of Manchester.
- Richard Muddle (2006) "An object-oriented implementation of block preconditioning for the C^1 finite element discretisation of the biharmonic equation". MSc in Computational Science and Engineering, University of Manchester.
- Daniel Meyer (2005) "Oscillatory two-layer flow in a rotating cylinder". MSc in Theoretical and Applied Fluid Dynamics, University of Manchester.
- Gemma Barson (2004) "Object-oriented mesh generation". MSc in Numerical Analysis and Scientific Computing, University of Manchester.

1.4 PDF file

A pdf version of this document is available.