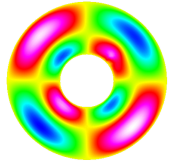


4th Elmer/Ice users meeting 26 April 2017 – Vienna (EGU 2017)

Program

- ✓ What's new since last users meeting? (O. Gagliardini)
- ✓ Intel Xeon Phi development (HPC) and ISCAL solver (T. Zwinger)
- ✓ Permafrost model (T. Zwinger)
- ✓ Calving, Mesh adaptation (Joe Todd)
- ✓ Mapping ice thickness for various glacier types on Svalbard (Johannes Fürst)
- ✓ Coupling with ocean and atmosphere models (Nico Jourdain)
- ✓ The Elmer/Ice-sheet project (O. Gagliardini)
- ✓ GIA model (Lenneke Jong)
- ✓ Discussion about future developments (T. Zwinger, O. Gagliardini)

Elmer/Ice in relation to Elmer



Elmer is an open-source, parallel, Finite Element code, mainly developed by the CSC-IT Center for Science Ltd. in Finland.

Elmer is constantly developed towards improved performance, utilizing international projects such as FP7 PRACE and HPC Europa2.



Elmer/Ice builds on Elmer and includes developments related to glaciological problems. Elmer/Ice includes a variety of dedicated solvers and user functions for glaciological applications and its development is supported by various groups and funding...



norden

Top-level Research Initiative



Important links

Elmer at CSC (documentation, how to install, ...)

<http://www.elmerfem.org/>

<http://www.csc.fi/english/pages/elmer>

Elmer Forum

<http://elmerfem.org/forum/>

Elmer/Ice webpage

<http://elmerice.elmerfem.org/>

Elmer/Ice wiki

<http://elmerice.elmerfem.org/wiki/doku.php?>

Elmer/Ice mailing list

To subscribe to the Elmer/Ice list *elmerice@elmerfem.org*, just sent an email to *majordomo@elmerfem.org*, with in the body the text:

subscribe elmerice

If you do not know how to use mailing lists run by majordomo you may sent a mail with "help" in the message body.

What's new since the last users meeting (2015)?

Elmer/Ice courses

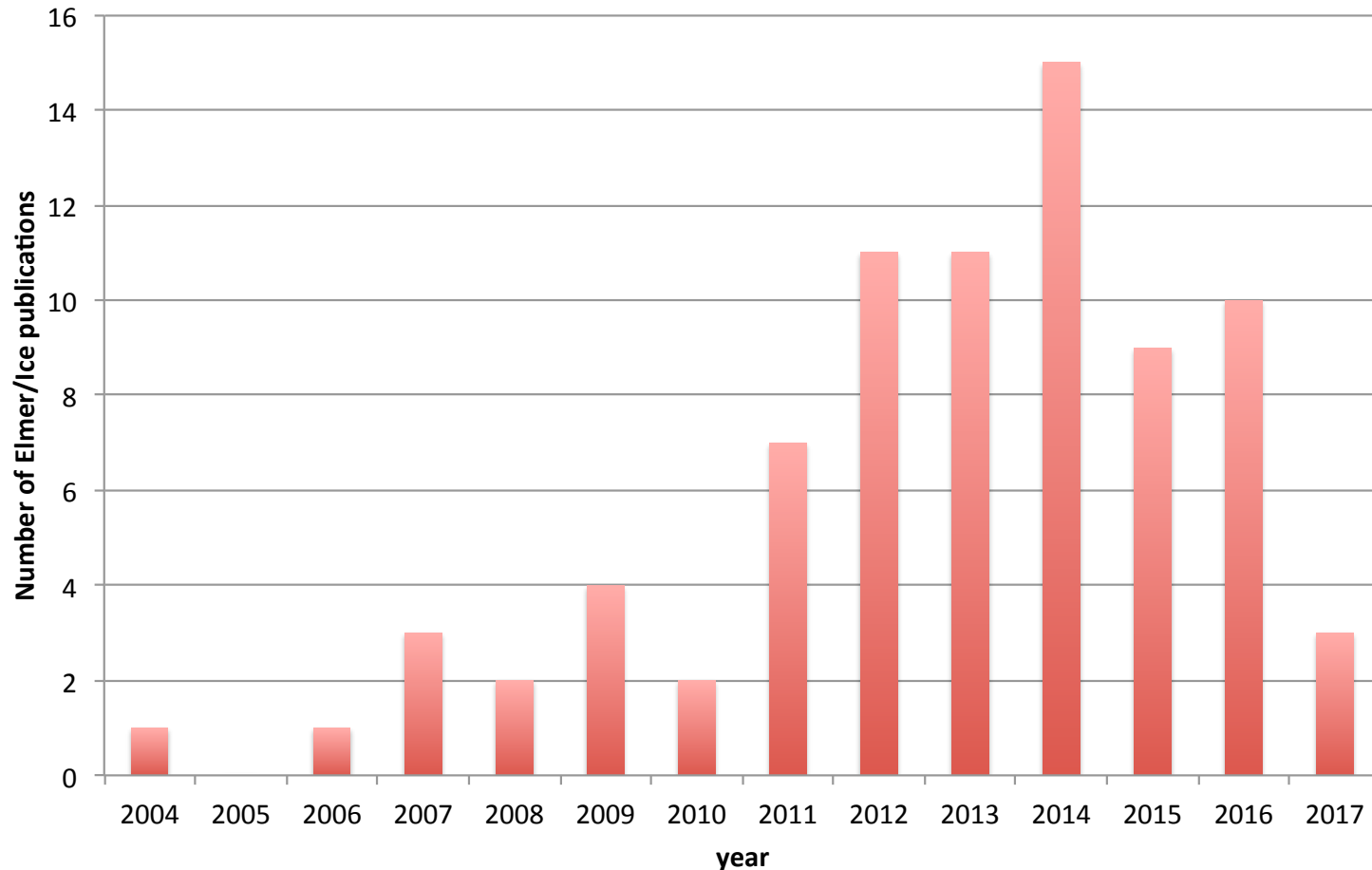
- ✓ 3-day beginner Elmer/Ice course, 31st Oct., 1st and 2nd Nov. 2016, Univ. Oslo, Oslo, Norway.
- ✓ 3-day advanced Elmer/Ice workshop, 30th Nov., 1st and 2nd Dec. 2015, LGGE, Grenoble, France.
- ✓ 2-day beginner Elmer/Ice course, 2-3 Nov. 2015, CIC, NBI, Copenhagen, Denmark.

Planned courses :

- ✓ 2-day beginner Elmer/Ice course, 23-24 Oct 2017, Stockholm
- ✓ 3-day advanced Elmer/Ice course, November 2017? Helsinki or Grenoble... to be decided

Elmer/Ice applications

79 publications using Elmer/Ice since 2004 (+22)



Elmer/Ice at EGU 2017

Monday, 24 Apr

- Eva de Andrés, Jaime Otero, Francisco Navarro, Agnieszka Prominska, Javier Lapazaran, and Waldemar Walczowski, A fjord-glacier coupled system model. Mon, 24 Apr, 13:30–13:45, Room G2
- Joe Todd, Poul Christoffersen, Thomas Zwinger, Peter Råback, Nolwenn Chauché, Alun Hubbard, Nick Toberg, Adrian Luckman, Doug Benn, Donald Slater, and Tom Cowton. A 3D Full-Stokes Calving Model Applied to a West Greenland Outlet Glacier. Mon, 24 Apr, 14:30–14:45, Room G2

Tuesday, 25 Apr

- Yongmei Gong, Thomas Zwinger, Jan Åström, Rupert Gladstone, Thomas Schellenberger, Bas Altena, and John Moore. Basal friction evolution and crevasse distribution during the surge of Basin 3, Austfonna ice-cap – offline coupling between a continuum ice dynamic model and a discrete element model. Tue, 25 Apr, 16:30–16:45, Room -2.32
- Yasmina M. Martos, Carlos Martin, and David G. Vaughan. New basal temperature and basal melt rate maps of Antarctica. Tue, 25 Apr, 17:30–19:00, Hall X5

Wednesday, 26 Apr

- Johannes J. Fürst, Thorsten Seehaus, Björn Sass, Kjetil Aas, Toby J. Benham, Julian Dowdeswell, Xavier Fettweis, Fabien Gillet-Chaulet, Geir Moholdt, Francisco Navarro, Christopher Nuth, Rickard Petterson, and Matthias Braun. A two-step mass-conservation approach to infer ice thickness maps: Performance for different glacier types on Svalbard. Wed, 26 Apr, 17:30–19:00, Hall X4

Elmer/Ice at EGU 2017

Thursday 27 Apr

- Shahbaz Memon, Dorothee Vallot, Thomas Zwinger, and Helmut Neukirchen. Coupling of a continuum ice sheet model and a discrete element calving model using a scientific workflow system. Thu, 27 Apr, 08:45–09:00, Room L2
- Doug Benn, Jan Åström, Thomas Zwinger, Joe Todd, and Faezeh Nick. Modelling tidewater glacier calving: from detailed process models to simple calving laws. Thu, 27 Apr, 08:45–09:00, Room G2
- Mauro A. Werder, Basile de Fleurian, Timothy T. Creyts, Anders Damsgaard, Ian Delaney, Christine F. Dow, Olivier Gagliardini, Matthew J. Hoffman, Julien Seguinot, Aleah Sommers, Inigo Irarrazaval Bustos, and Jakob Downs. Subglacial Hydrology Model Intercomparison Project (SHMIP). Thu, 27 Apr, 09:45–10:00, Room G2

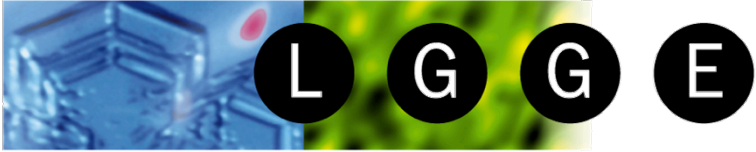
- Olivier Passalacqua, Marie Cavitte, Massimo Frezzotti, Olivier Gagliardini, Fabien Gillet-Chaulet, Frédéric Parrenin, Catherine Ritz, Luca Vittuari, and Duncan Young. A mechanical diagnosis of the ice flow around Dome C: Elmer/Ice 3D simulations constrained by measured surface velocities and radar isochrones. Thu, 27 Apr, 17:30–19:00, Hall X5
- Dorothee Vallot, Rickard Pettersson, Adrian Luckman, Douglas I. Benn, Thomas Zwinger (presenting), Ward van Pelt, Jack Kohler, Martina Schäfer, Björn Claremar, and Nicholas R. J. Hulton. Influence of surface changes on spatio-temporal variations of basal properties for Kronebreen, Svalbard. Thu, 27 Apr, 17:30–19:00, Hall X5
- Rupert M. Gladstone, Thomas Zwinger (presenting), Fabien Gillet-Chaulet, and John C. Moore. Basal shear stress and choice of sliding relation in Antarctic Ice Sheet simulations. Thu, 27 Apr, 17:30–19:00, Hall X5
- Denis Cohen, Thomas Zwinger, Wilfried Haeberli, and Urs H. Fischer. Did permafrost modify basal conditions during the Last Glacial Maximum? The case of the Rhine glacier, Swiss Alps. Thu, 27 Apr, 17:30–19:00, Hall X2
- Fabien Gillet-Chaulet, Laure Tavard, Nacho Merino, Vincent Peyaud, Julien Brondex, Gael Durand, and Olivier Gagliardini. Anisotropic mesh adaptation for marine ice-sheet modelling. Thu, 27 Apr, 17:30–19:00, Hall X5
- Lenneke Jong, Rupert Gladstone, and Ben Galton-Fenzi. Coupled ice sheet-ocean modelling to investigate ocean driven melting of marine ice sheets in Antarctica. Thu, 27 Apr, 17:30–19:00, Hall X5

Elmer/Ice at EGU 2017

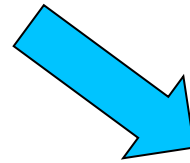
Friday, 28 Apr

- Reinhard Drews, Christoph Mayer, Olaf Eisen, Veit Helm, Todd A. Ehlers, Frank Pattyn, Sophie Berger, Lionel Favier, Ian H. Hewitt, Felix Ng, Johannes J. Fürst, Fabien Gillet-Chaulet, Nicolas Bergeot, and Kenichi Matsuoka. Fun at Antarctic grounding lines: Ice-shelf channels and sediment transport. Fri, 28 Apr, 08:52–08:54, PICO spot 3
- Frédéric Parrenin, Marie Cavitte, Donald Blankenship, Jérôme Chappellaz, Hubertus Fischer, Olivier Gagliardini, Fabien Gillet-Chaulet, Valérie Masson-Delmotte, Olivier Passalacqua, Catherine Ritz, Jason Roberts, Martin Siegert, and Duncan Young. Is there 1.5 million-year old ice near Dome C, Antarctica? Fri, 28 Apr, 10:48–10:50, PICO spot 3

LGGE -> IGE



Laboratoire de Glaciologie et Géophysique de l'Environnement



Institut
des géosciences
de l'environnement

Elmer/Ice capabilities

	Flow equations	Stokes	SSA	SSA*	SIA	ISCAL
Rheology	Glen	X, Inv Adj + Rob	X, Inv Adj	X	X	X
	GOLF	X				
	CAFFE	X				
	POROUS	X				
	Damage	X	X	X	X	X
Basal friction	Linear	X, Inv Adj + Rob	X, Inv Adj	X		
	Weertman	X	X	X		
	Coulomb	X	X	X		
	Budd	X	X	X		
	Tsai		X	X		
Free surface	dS/dt	X	X	X	X	X
	dH/dt	X, Inv	X, Inv	X, Inv	X, Inv	X, Inv
Grounding line	Contact	X				
	Hydrostatic	X	X	X	X	
Calving	Fracture+Damage	2D				
	crevasse depth	X				
Temperature	Temperate	X	X	X	X	X
	Enthalpy	X	X	X	X	X
Hydrology	Two layers	X	X	X		
	<i>GlaDS</i>	X	X	X		