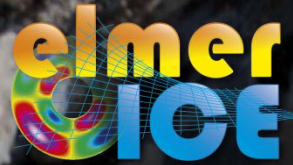




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PhD presentation

Dorothee Vallot
Elmer/ice meeting
EGU 2013



My PhD in a nutshell



- Start february 2013 at department of Earth Sciences in Uppsala, Sweden (4 years)
- Supervisors
 - Rickard Pettersson (department of Earth Sciences)
 - Ken Mattsson (Department of IT and scientific computing department)
- Use of finite element open source software ELMER/ICE
- Study of boundary conditions
 - Interaction ice/water/sediments
 - Calving front destabilization



Basal boundary conditions



- Inverse modelling and seasonal evolution of basal drag
 - Kronebreen and/or Nordenskiöldsbreen, Svalbard (Doug Benn's velocity data)
 - Vestfonna (Martina's model) and/or Austfonna (Rupert's model) with focus on Franklinbreen and Basin 3 respectively
- Deformable sediment model (in collaboration with Rupert)



(Source: www.toposvalbard.npolar.no)



Calving boundary condition



- Calving events and instability of the front of Tunabreen, Svalbard
 - Surging between 2002 and 2005, now retreating
 - Highest velocities at the front (high longitudinal strain rates)
 - Time-lapse camera at the front of Tunabreen
 - Follow-up of last summer fieldwork (based on Chapuis, 2012)
- Statistical study of calving events
 - Size evaluation
 - Time evolution of size
 - Distribution of sizes and inter-event intervals
- Feed Jan Åström's model
 - particle-based simulation model
 - where a large ice-body is divided into discrete particles



Calving front of Tunabreen
(August 2012)



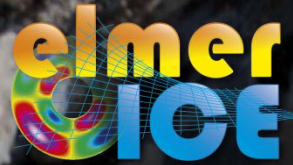
Elmer/ICE in Uppsala



- Developpement of a "glacio-modelling" group in Uppsala/Stockholm with Elmer/ICE users
 - Josefin Ahlkrona
 - Coupling of SIA and full Stokes in Elmer/ICE
 - Supervision
 - Per Lötstedt (Department of IT and scientific computing, Uppsala University)
 - Nina Kirchner (Department of Physical geography and Quaternary Geology, Stockholm University)
 - Lina Von Sydow (Department of IT and scientific computing, Uppsala University)
 - ...
- Elmer/ICE in UPPMAX computer cluster in Uppsala University



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Thanks!