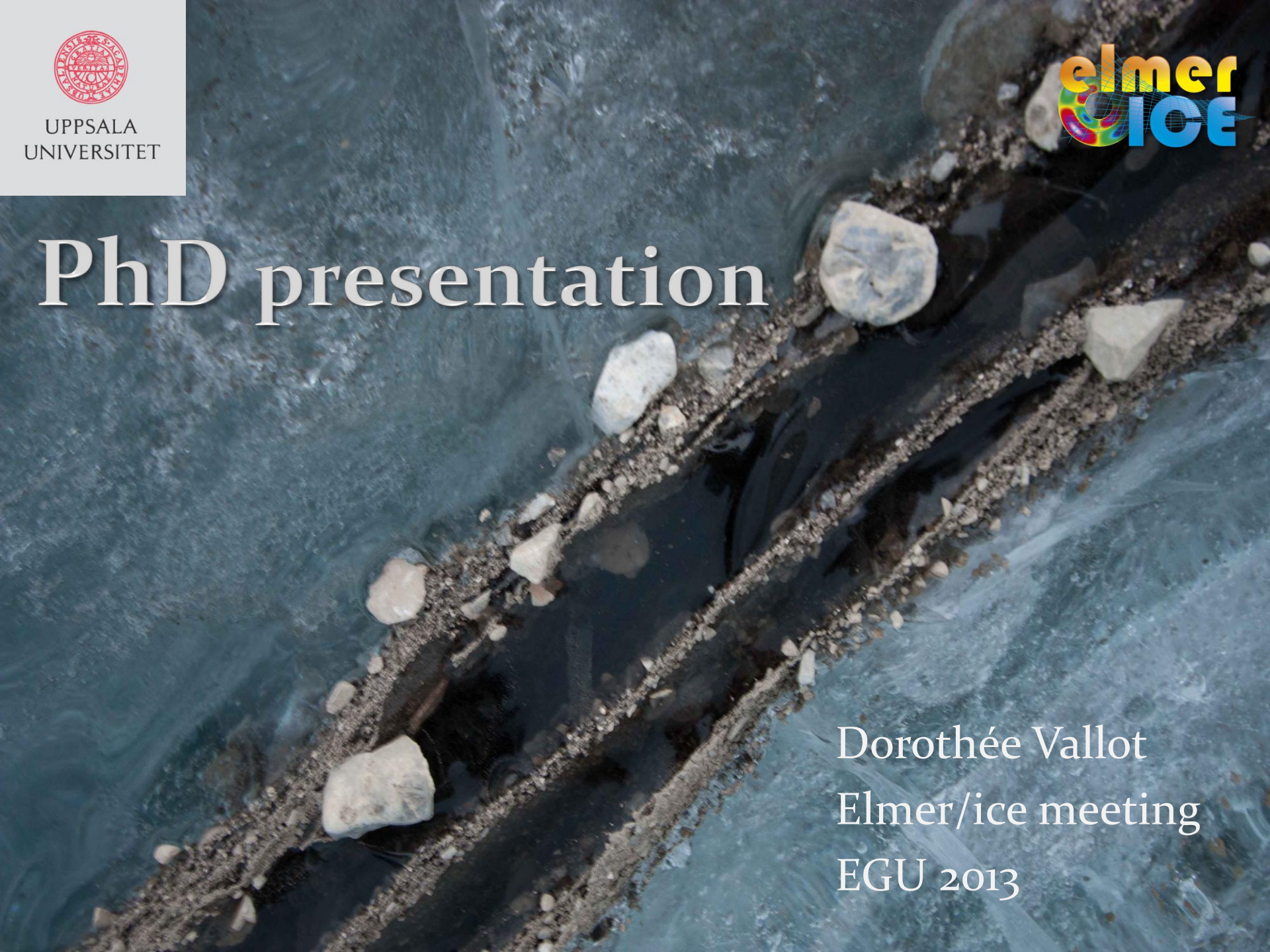

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PhD presentation

Dorothée 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)

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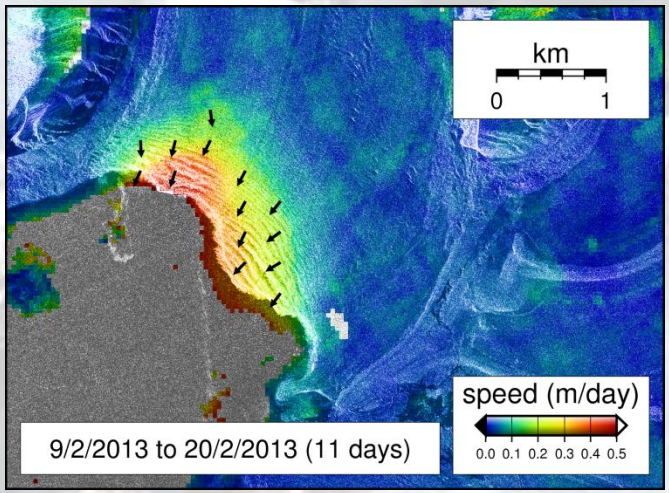
Calving boundary condition

- 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



Velocity at the front of Tunabreen
(Source: A. Luckman & D. Benn)

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!