Seminaire

Vendredi 11 Juillet 2014, 11h00

sallle LLL, LGGE

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Deformation and degradation of glacier ice:
Theory, modeling and field measurements on an Alpine glacier

In the first part of this talk, a new approach to continuum damage mechanics for glacier ice is discussed. A constitutive framework is given which contains viscoelastic and viscoplastic deformations, and a rank-4 damage variable coupled to viscoelastic deformation via a fiber bundle approach. Furthermore, the thermodynamics of a continuum system with an internal rank-4 variable are investigated. As an illustration, a simplified version of the new constitutive theory for damage is implemented in a 2D finite element model of glacier flow, which is applied to the retreat of a glacier through a basal depression.
The second part deals with the problem of how to implement a continuum damage model into the shallow shelf approximation. A 0th-order shallow shelf approximation allows a simple yet consistent treatment of both ice dynamics and damage evolution