Dynamique bi-stable des lacs sous-glaciaires

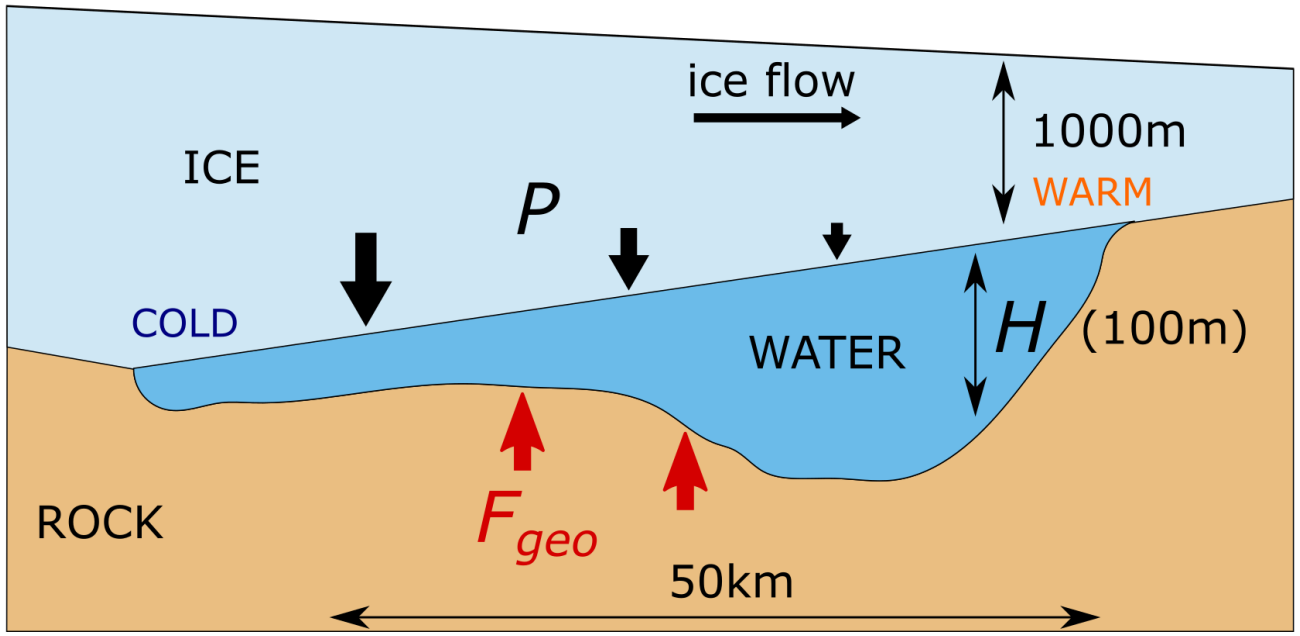
Bi-stable dynamics of subglacial lakes

Louis-Alexandre Couston (MCF)

ENSL, UCBL, CNRS, Laboratoire de physique, F-69342 Lyon, France

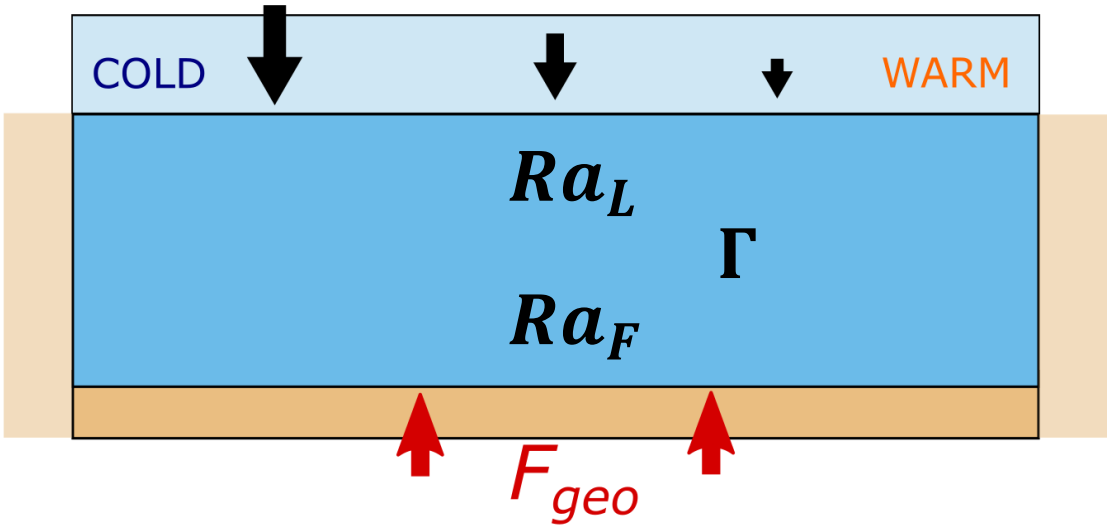
with M. Siegert, B. Favier, J. Nandaha, A. Villaret, C. Jacob

louis.couston@ens-lyon.fr https://louiscouston.github.io/

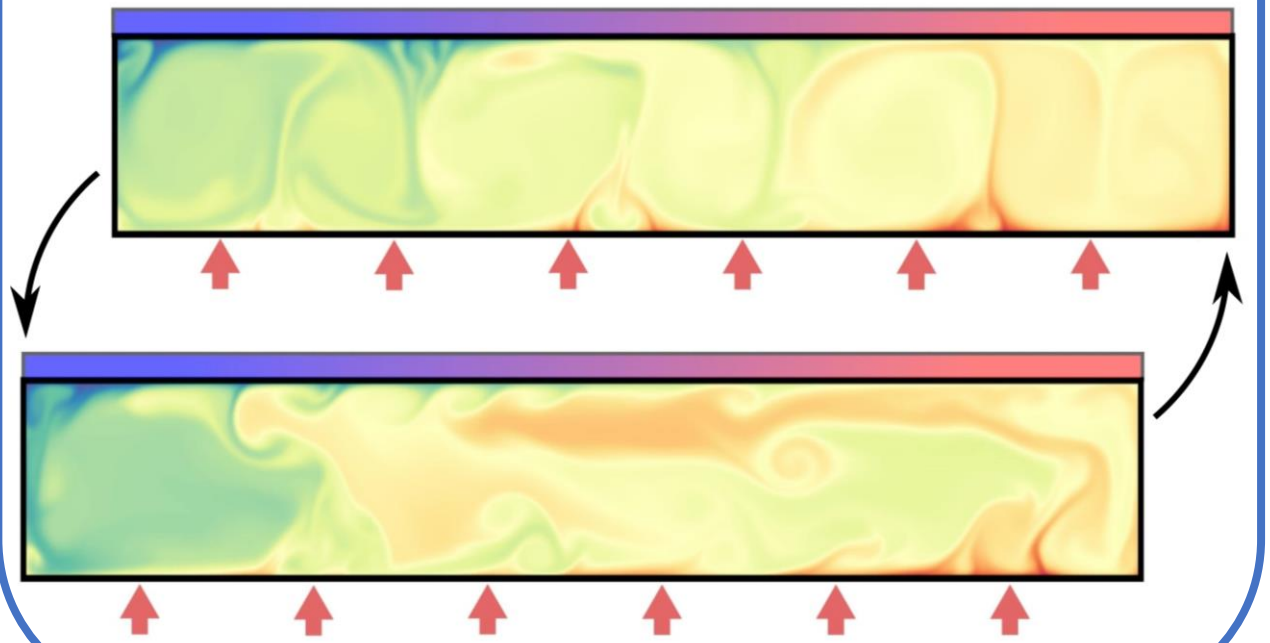


The experiment

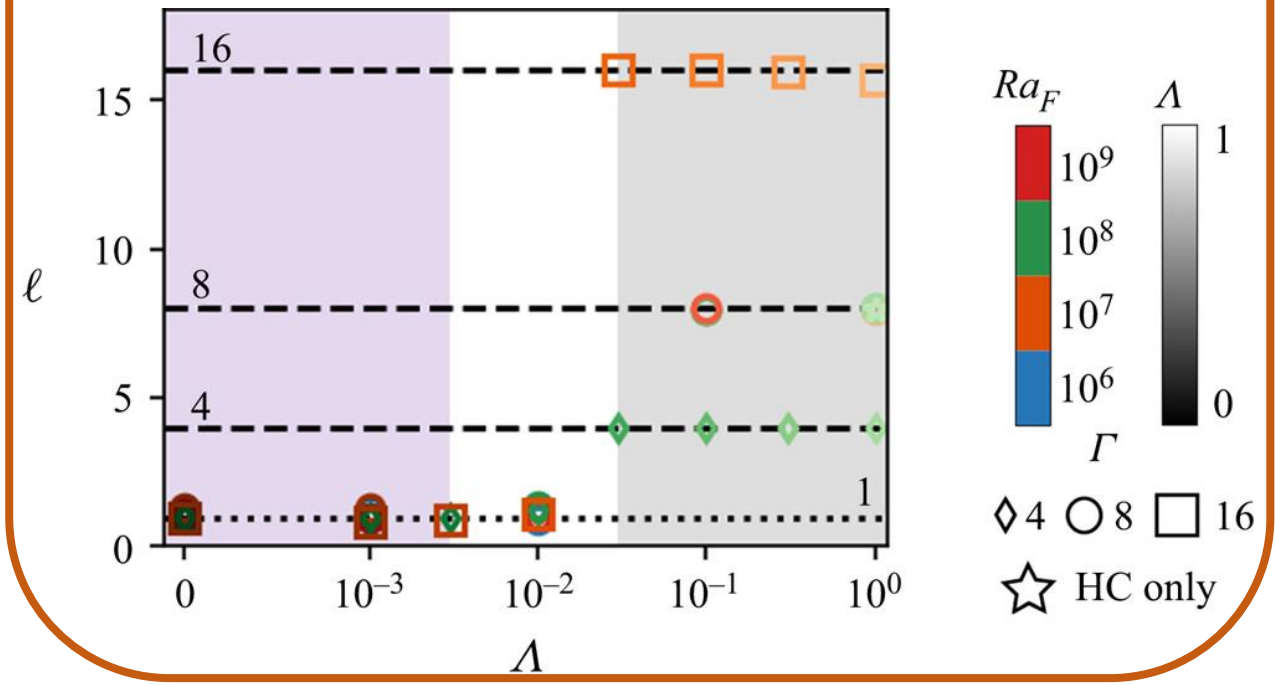
A competition btw Rayleigh-Bénard and horizontal conv.



❑ Two end members: **RB Conv.** & **Hor. Conv.**
❑ **Both members are stable** for some values of the control parameters



❑ We identified the dynamics from the autorcor. length
❑ The **transition always occurs** when $\Lambda = \frac{Ra_L}{Ra_F \Gamma^4} \approx 10^{-2}$
❑ **We don't have an explanation !**



❑ Slope effects, nonlinear equation of state, rotation effects, realistic geometry?
❑ Knowledge of SL hydrodynamics ⇒ help paleoclimate studies and astrobiology.

References

Couston, Nandaha, Favier, *JFM*, 947, A13 (**2022**) **Competition between Rayleigh–Bénard and horizontal convection**
And more…