

Journée OSUG : Quelles méthodes pour quelles instabilités ?

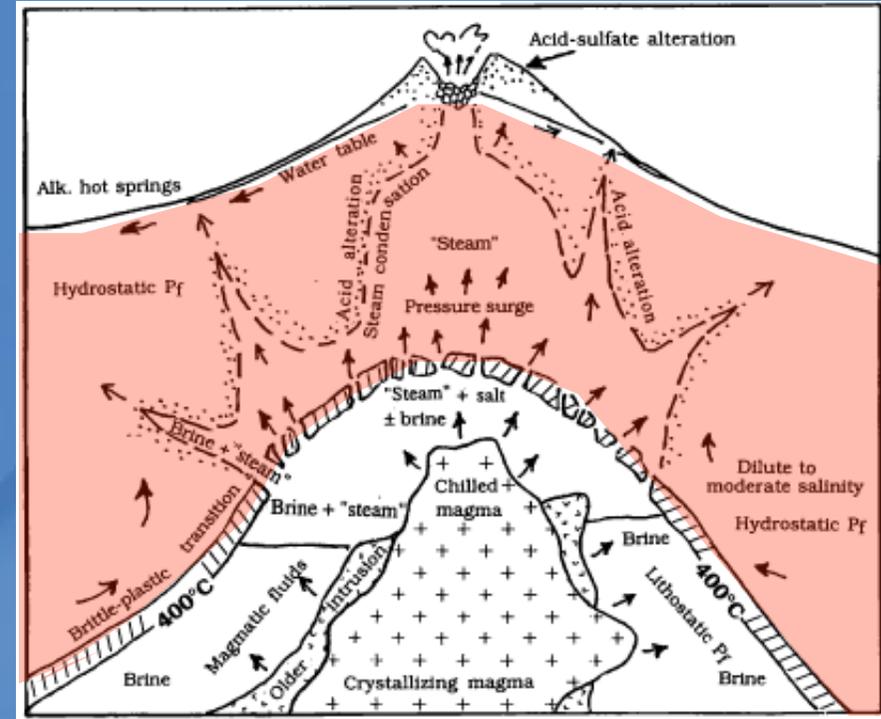
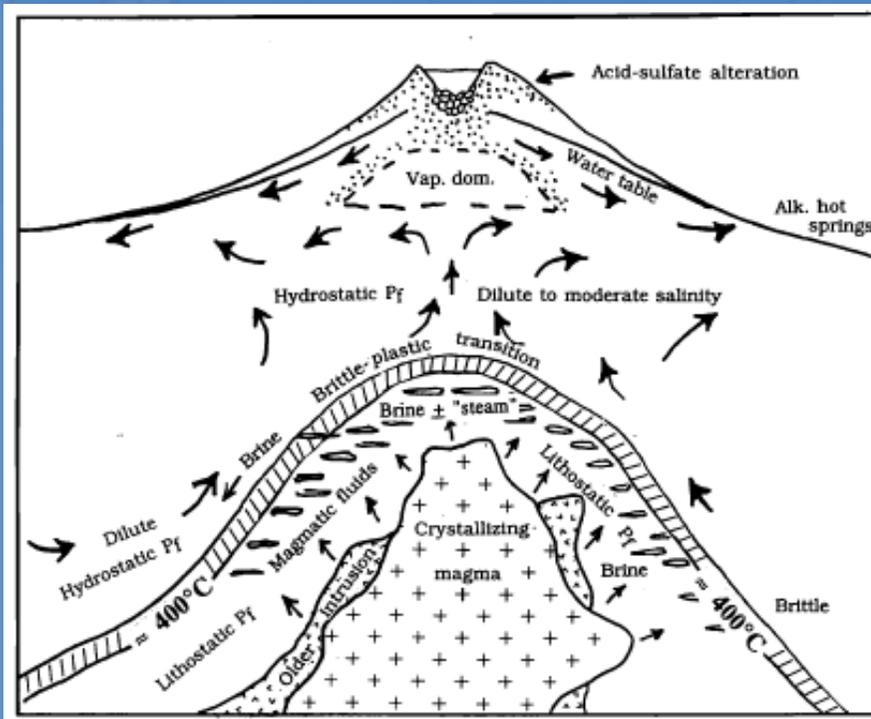
# Instabilités d'ébullition dans les systèmes hydrothermaux

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IFSTTAR

# Structure et Dynamique d'un système hydrothermal

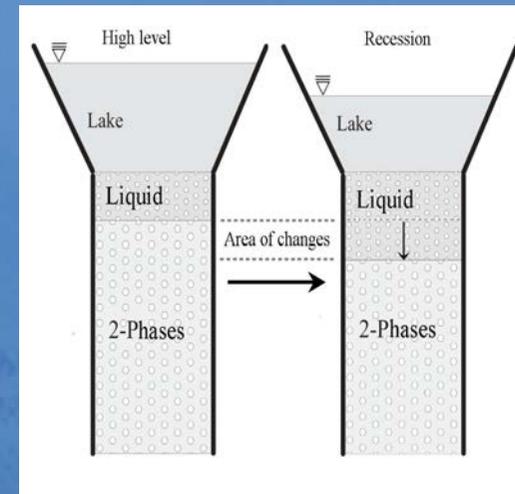
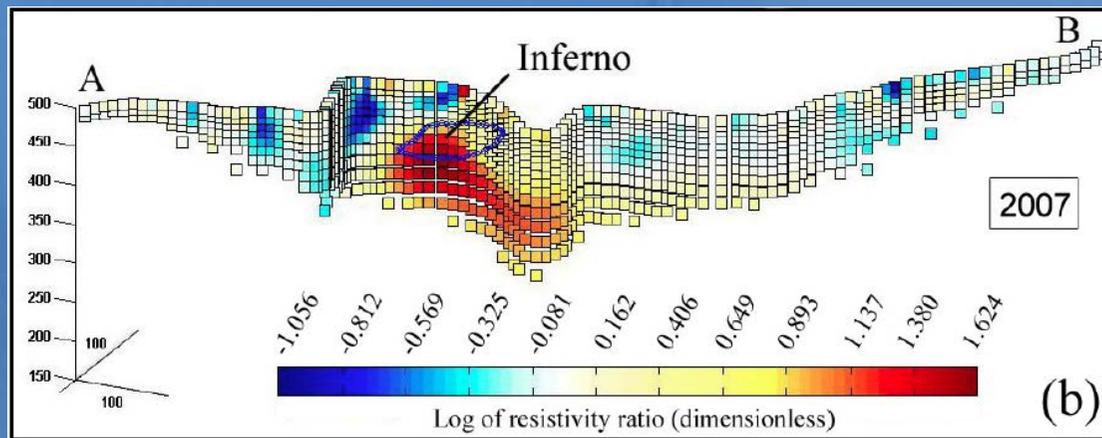
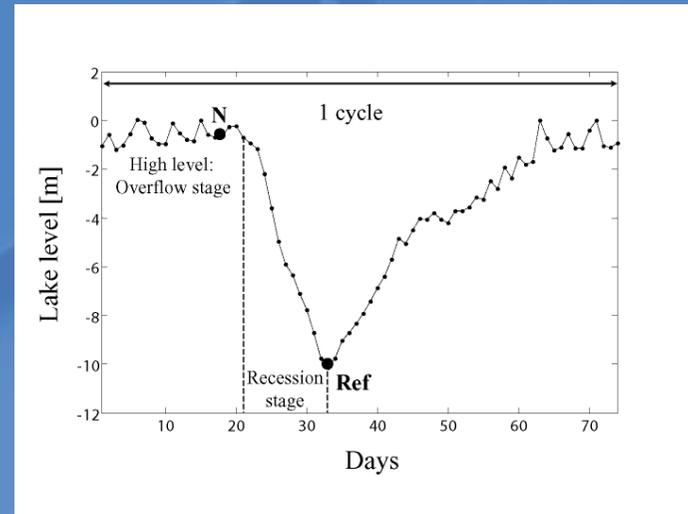


*R. Fournier, 1999, 2007*

- Etude des changements de phase à différentes échelles
- Quels types d'instabilités ? Quelles conséquences ?
- Comment les détecter ?
- Comment les étudier

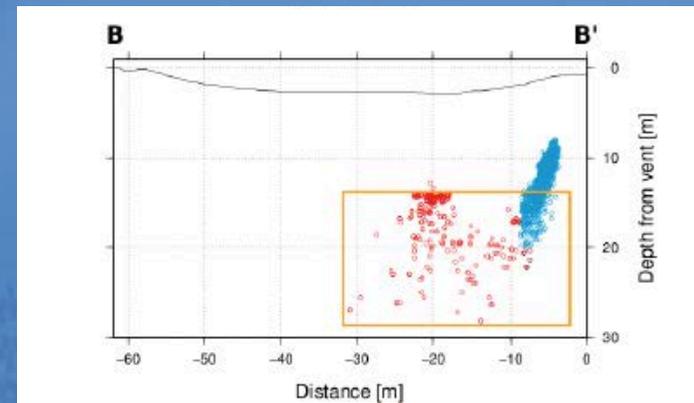
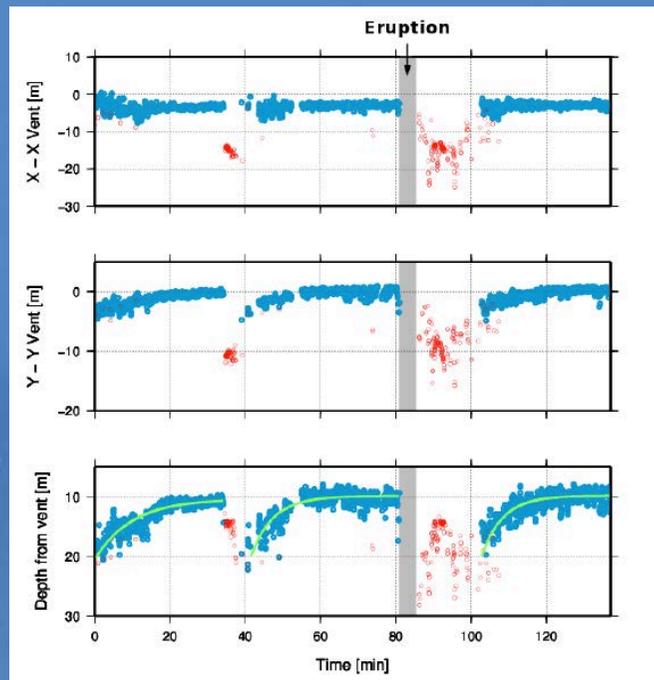
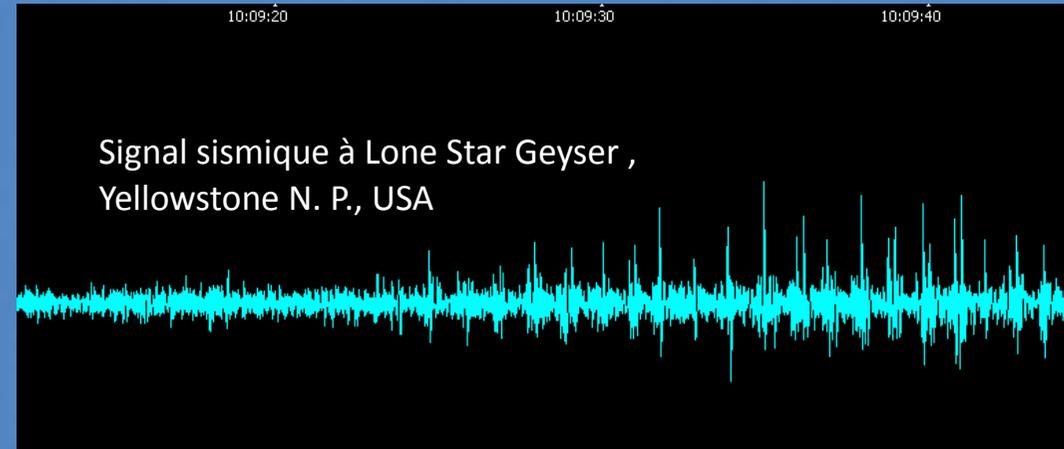
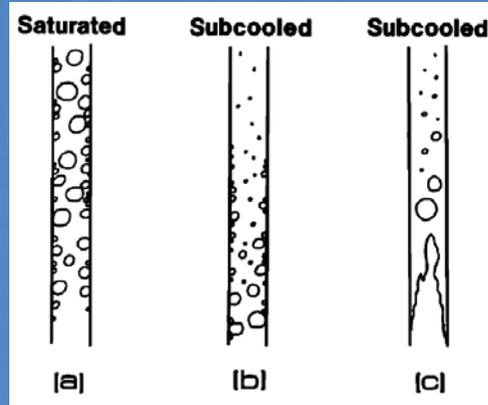
# Suivre la dynamique avec une imagerie 4D de résistivité

Taille du système : centaines de mètres,  $T \sim 40$  jours

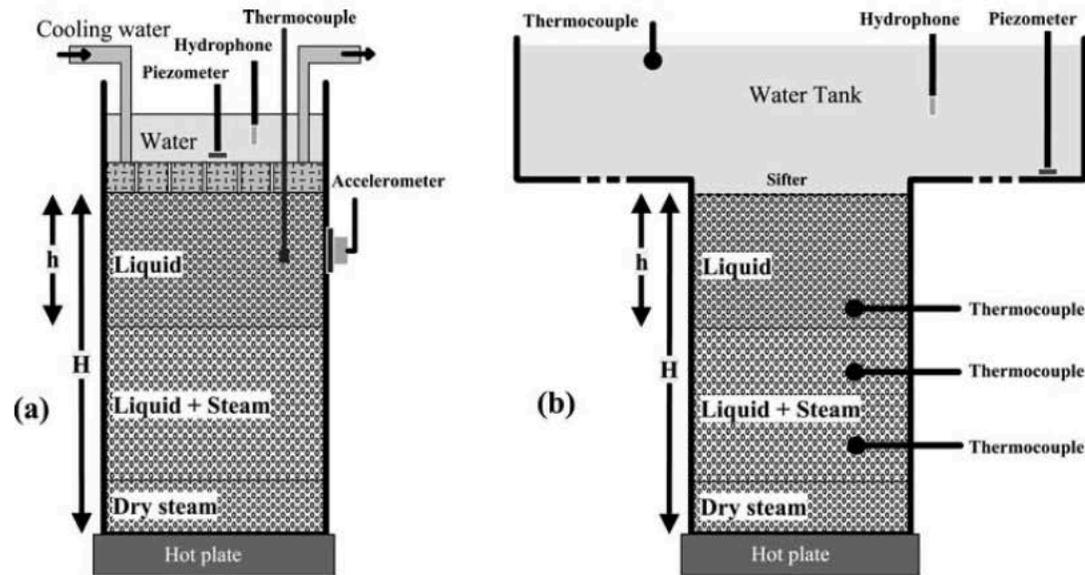


*Legaz et al., 2011*

# Détection de l'instabilité par le signal sismique

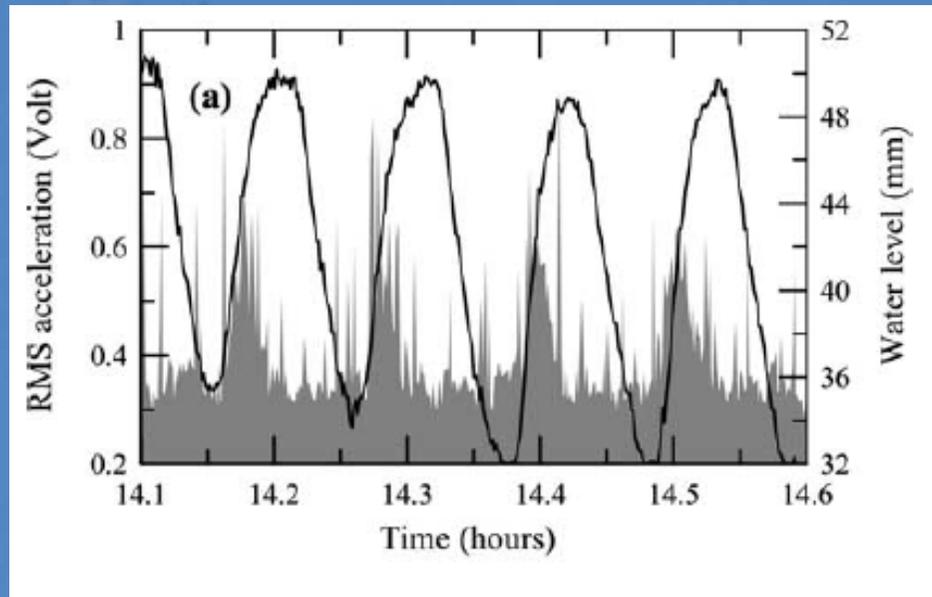


# Expériences analogiques



**Figure 1.** Sketch diagram of the analogue experiments: (a) acoustic experiment with fixed temperature, with the aspect ratio conserved; (b) simulation of boiling beneath a crater lake. The water tank size is not to scale.

# Énergie acoustique et taux d'ébullition



*Vandemeulebrouck et al., 2005*

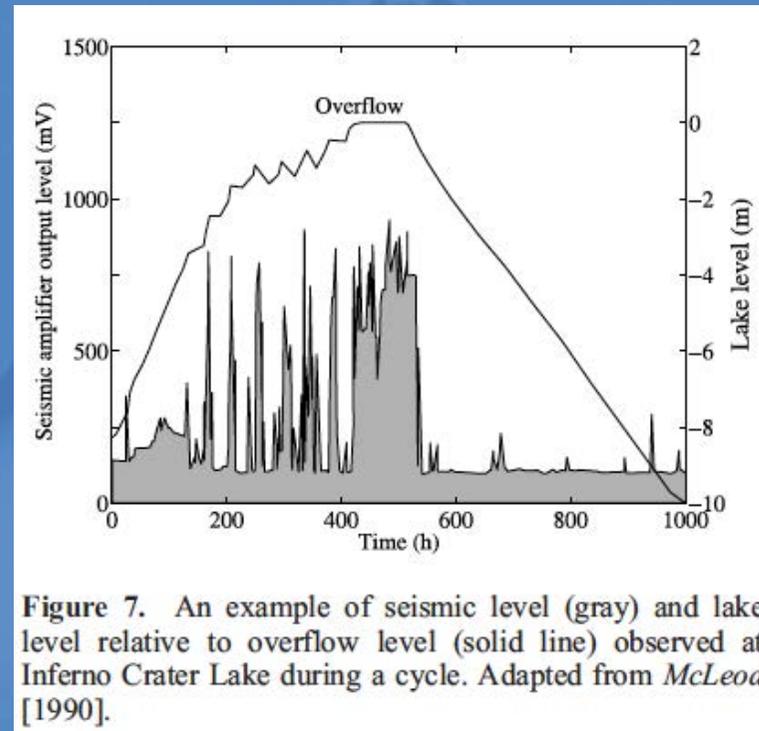
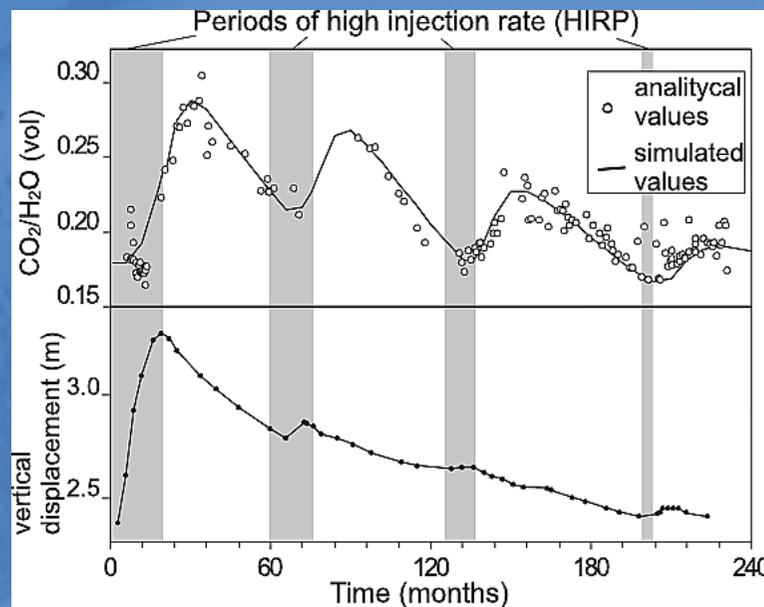
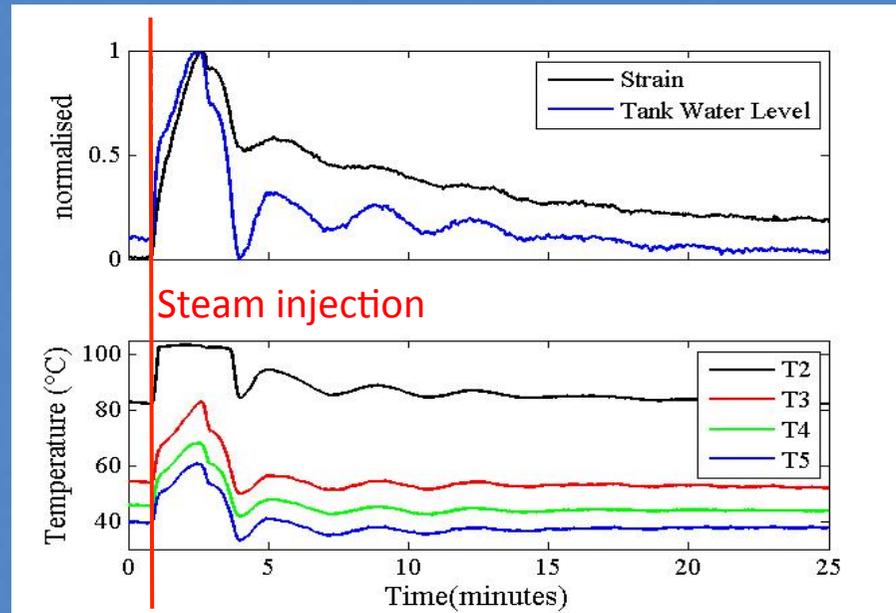
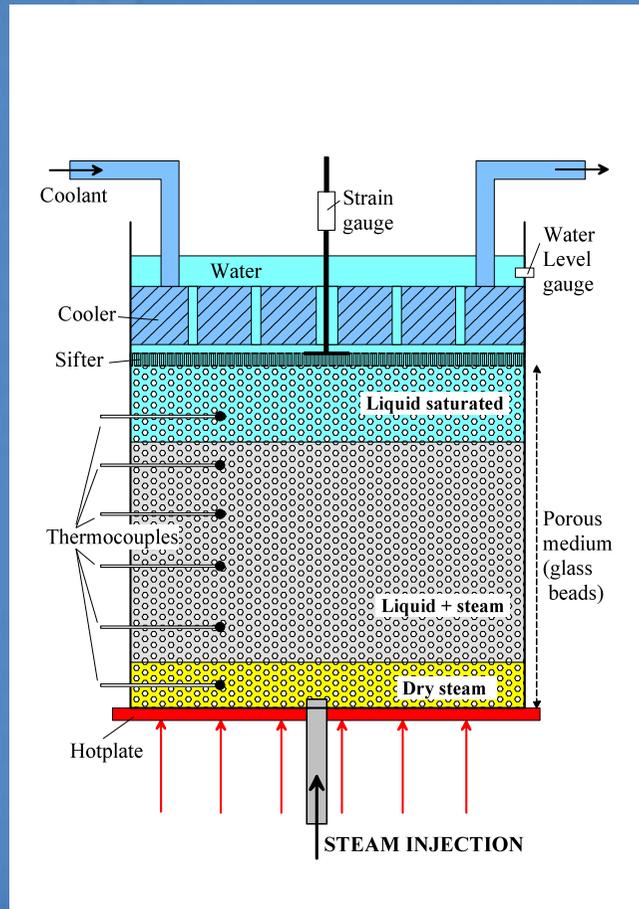


Figure 7. An example of seismic level (gray) and lake level relative to overflow level (solid line) observed at Inferno Crater Lake during a cycle. Adapted from *McLeod* [1990].

# Simulation analogique d'une injection de vapeur



*Chiodini et al., 2003*