

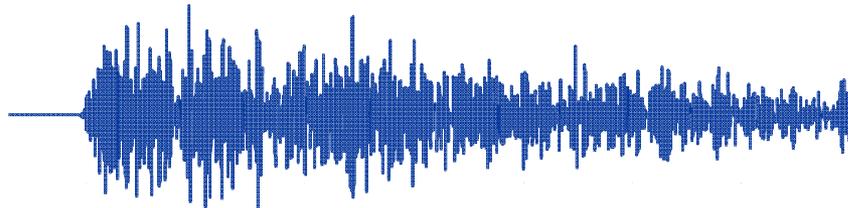
# Surveillance d'un glissement de terrain grâce au bruit sismique



E. Larose, G. Mainsant, D. Jongmans, L. Baillet  
*ISTerre, CNRS, Université de Grenoble, France*

C. Michoud, M. Jaboyedoff  
*Institut de Géomatique et d'Analyse des Risques (IGAR), Université de Lausanne, Suisse*

C. Brönnimann  
*Laboratoire de géologie de l'ingénieur et de l'environnement (GEOLEP), EPF Lausanne, Suisse*



# L'intuition de départ...

humidité



Perte de rigidité

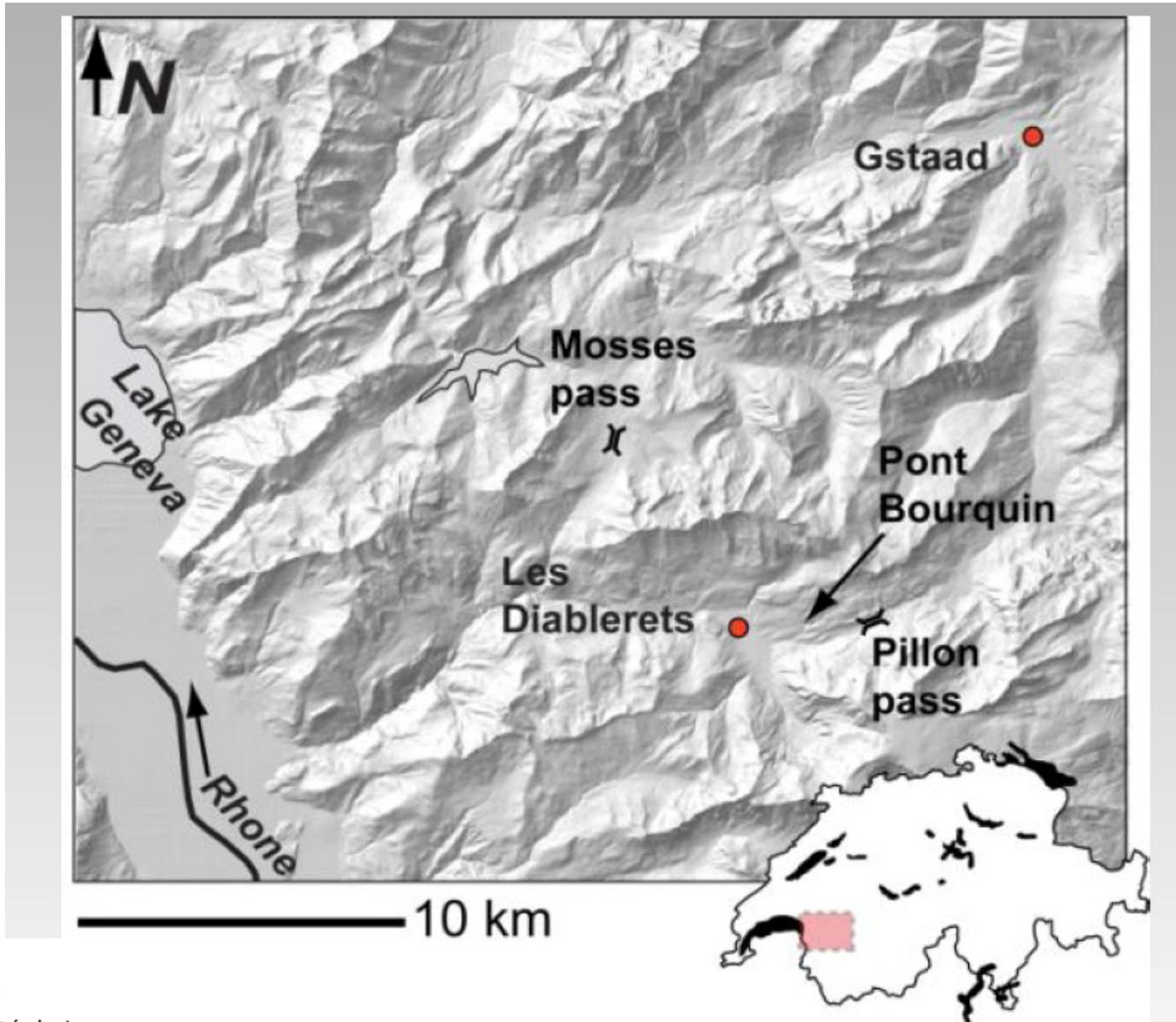


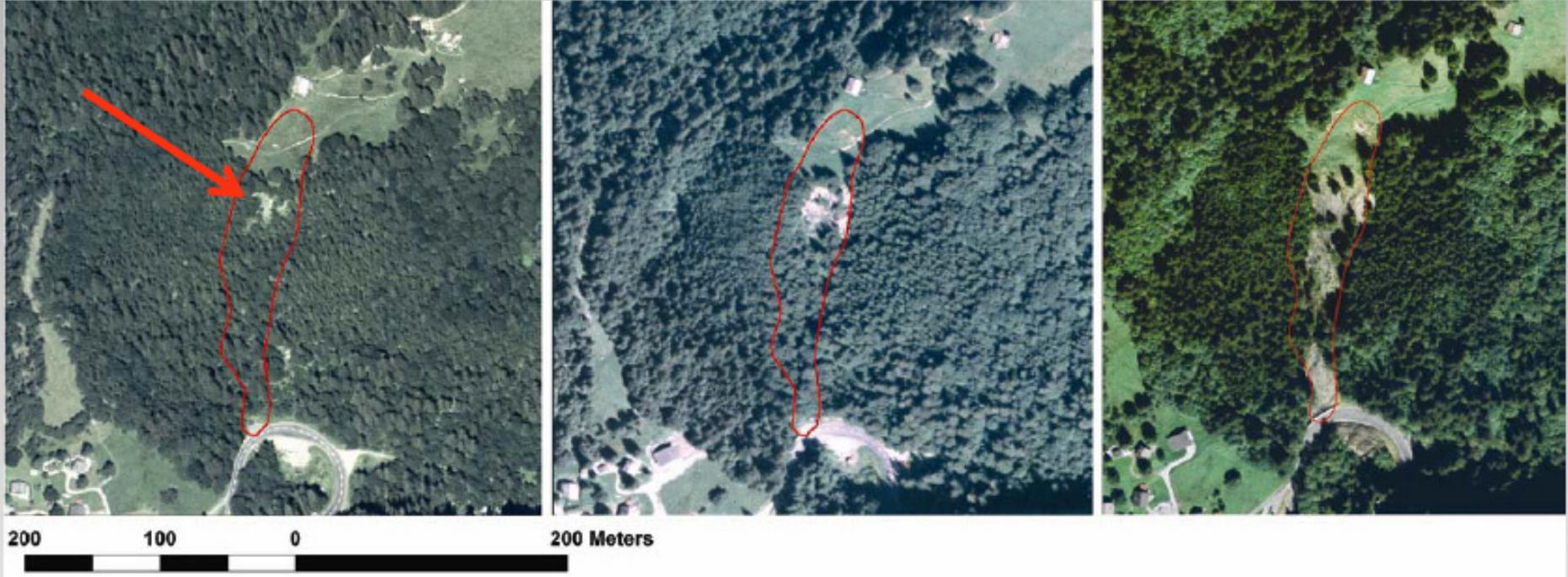
Mesure de  $V_s$



Liquéfaction, déstructuration, coulée

# Suivi (et prévision?) des glissements de terrain : Les Diablerets (Suisse)



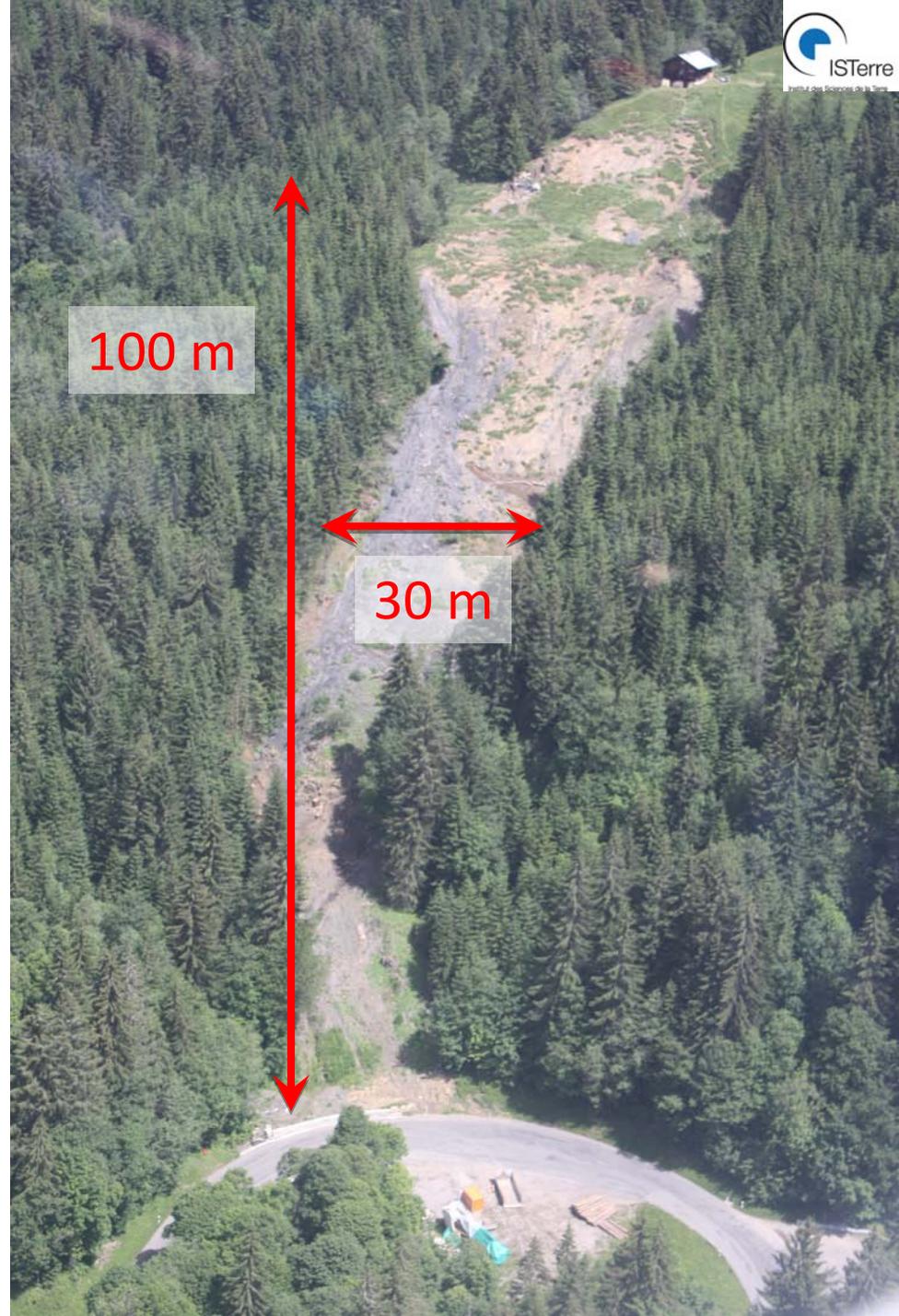
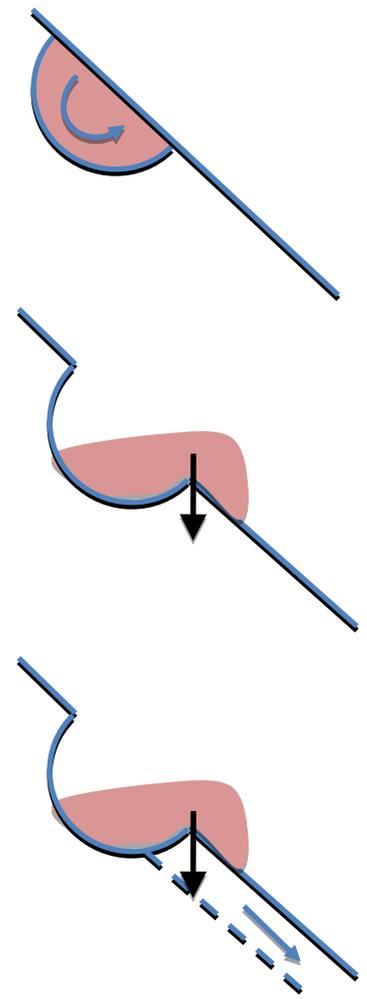


1998

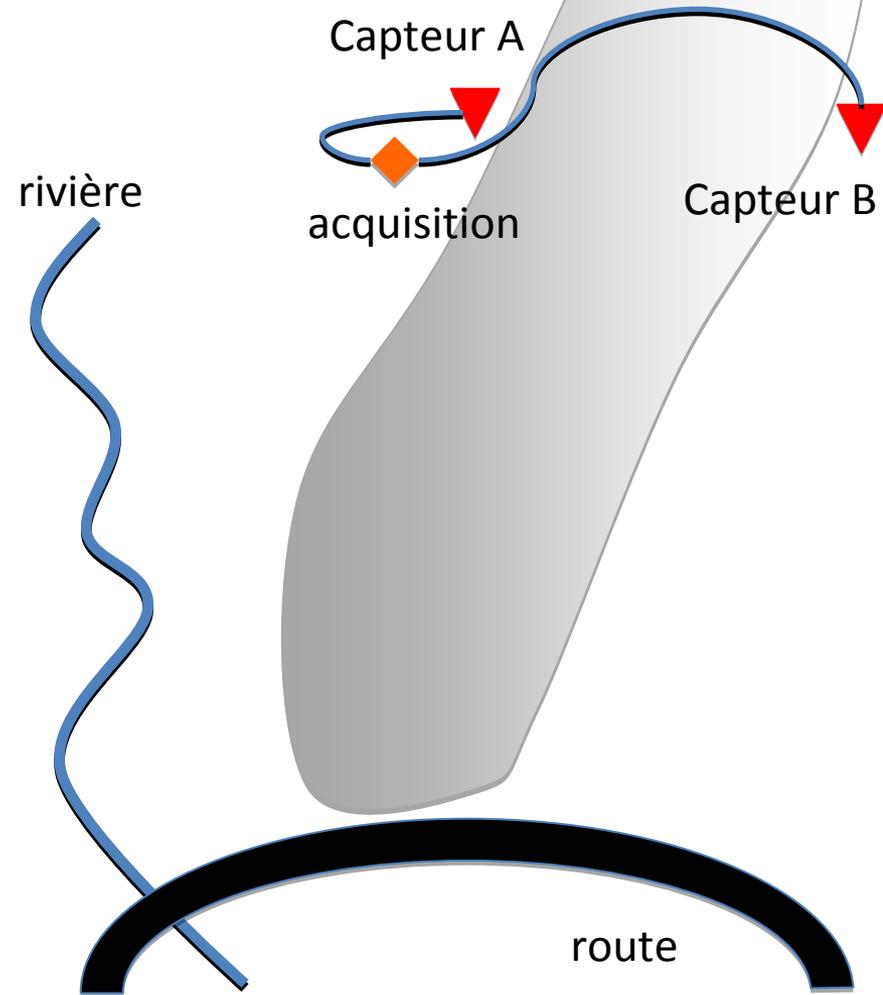
2004

2007

# Suivi (et prévision?) des glissements de terrain : Les Diablerets (Suisse)



Ecoute sismique : installation janvier 2010







20 mai 2010

23 aout 2010

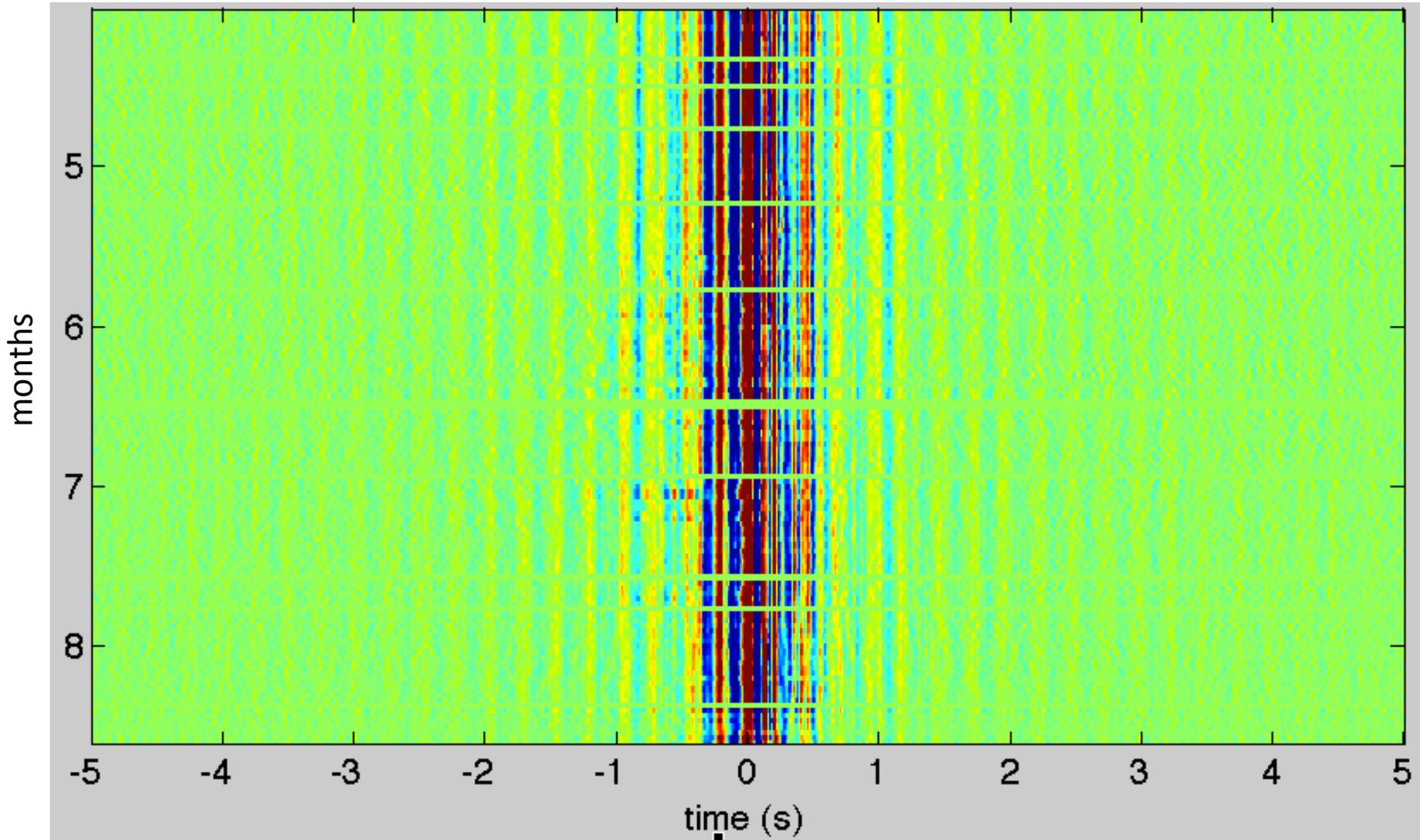




Aout 2010 : accélération du glissement + liquéfaction



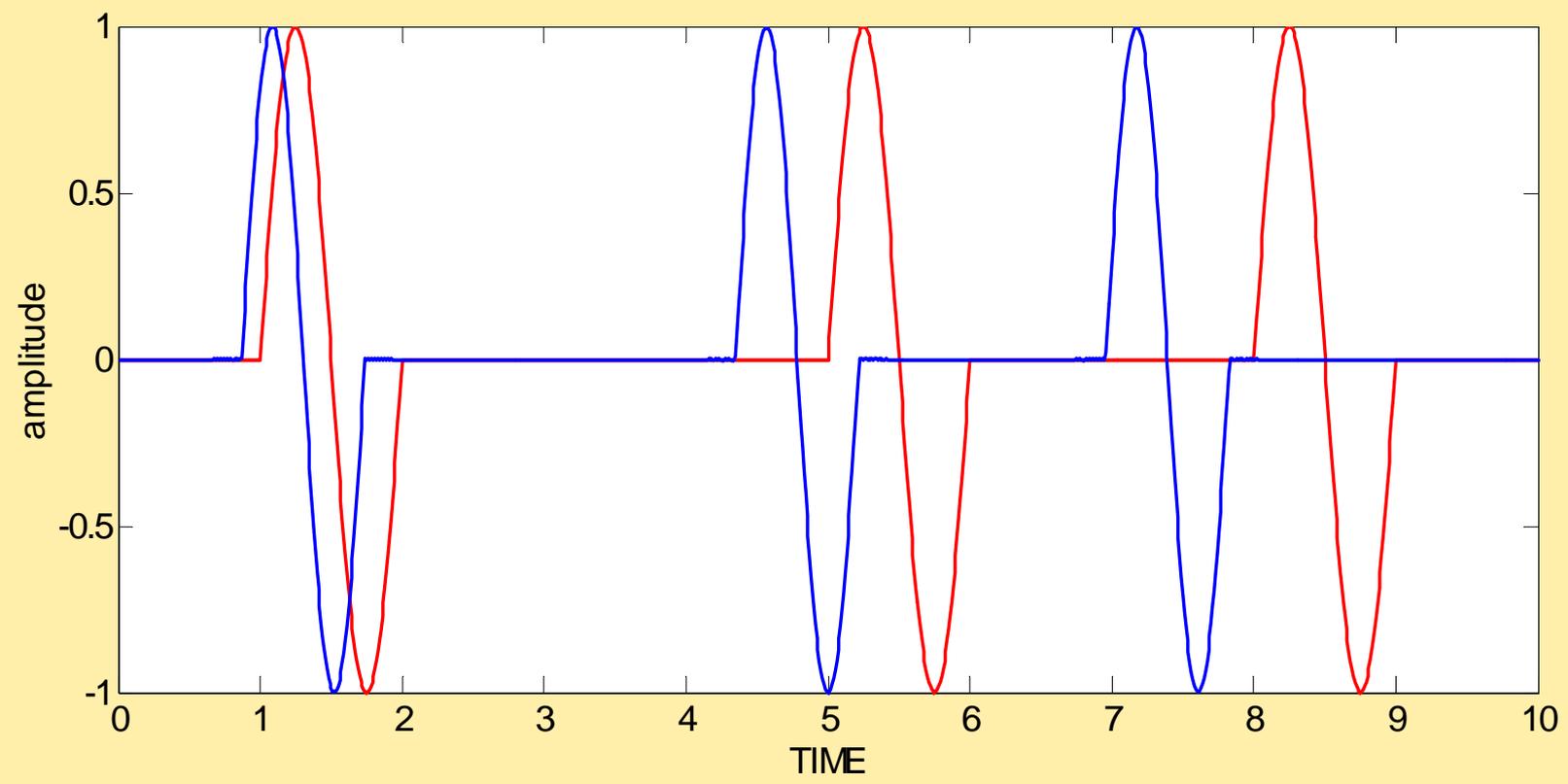
## Daily cross-correlation



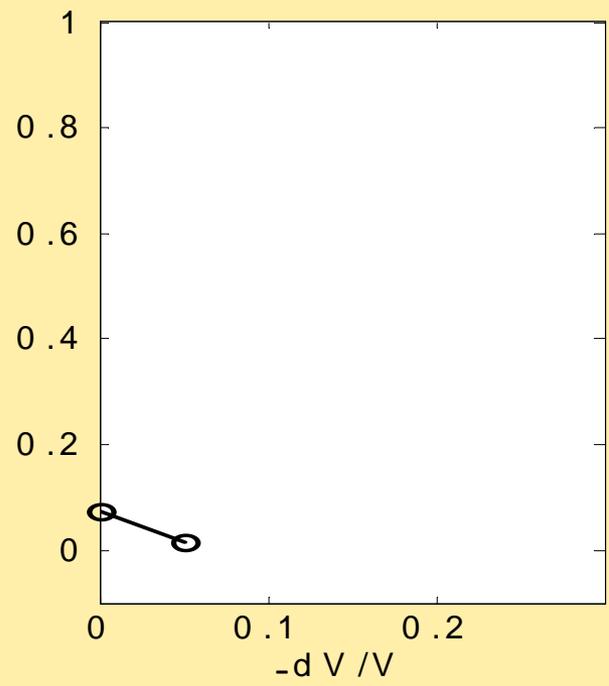
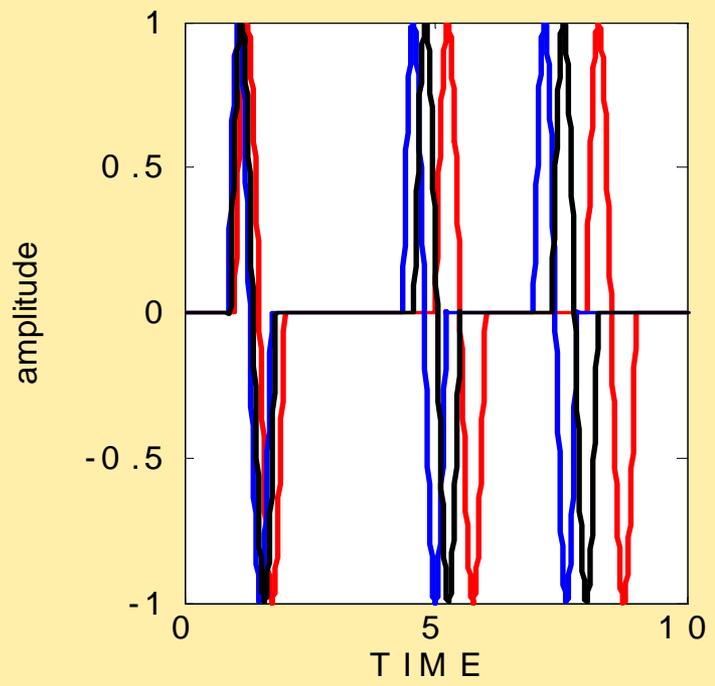
simulation

Date #1  
Cold = FAST

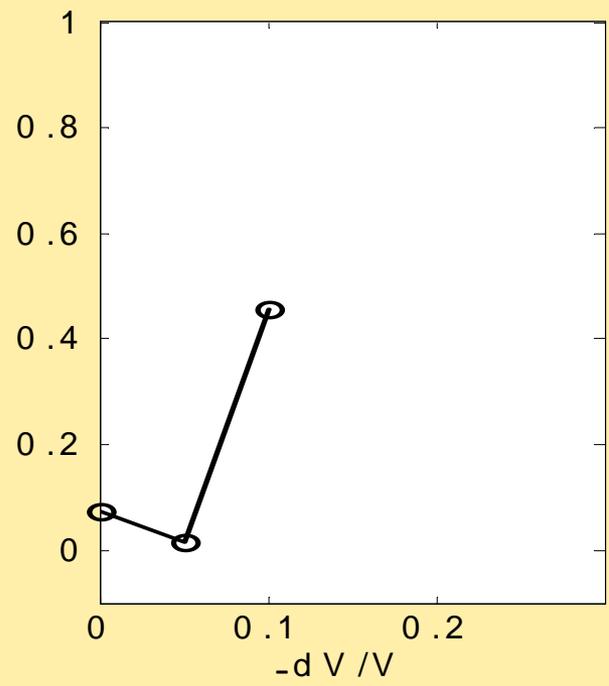
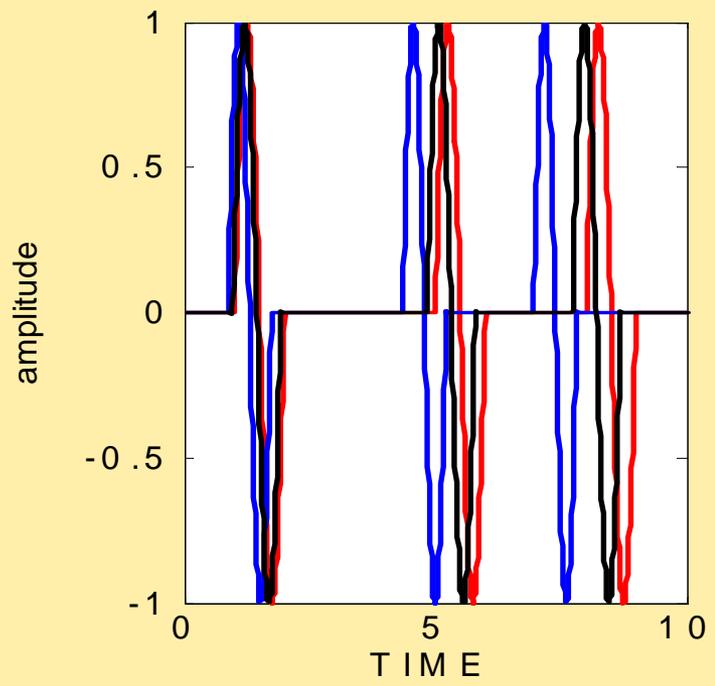
Date #2  
Hot = SLOW



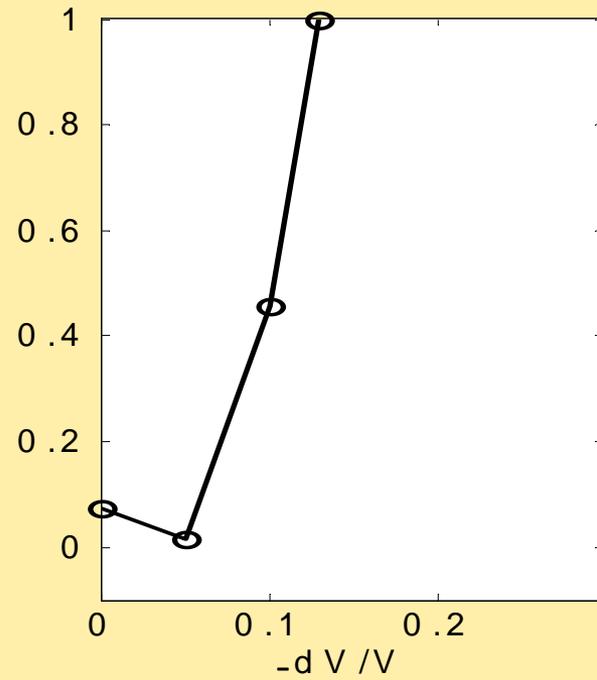
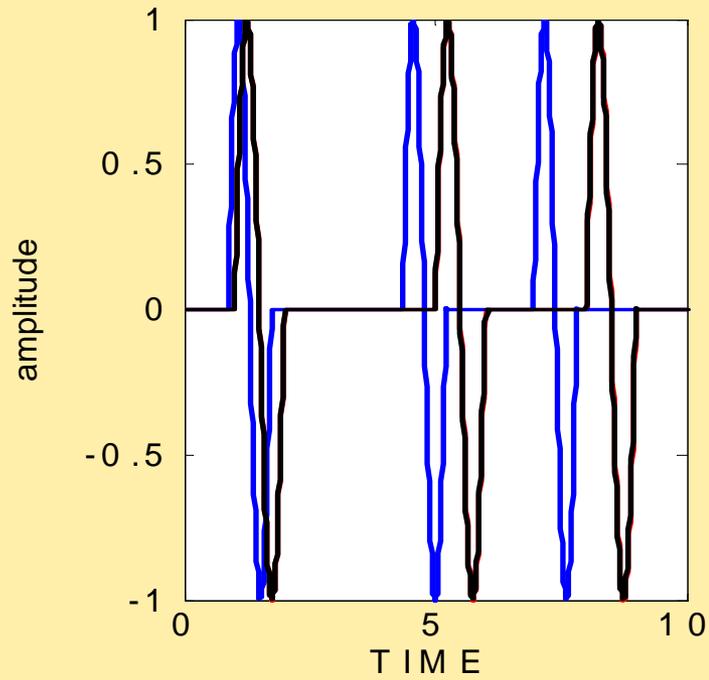
simulation



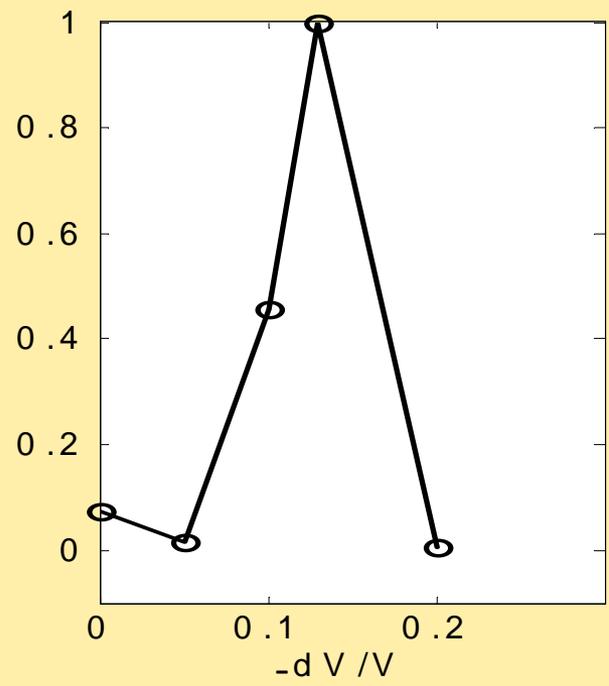
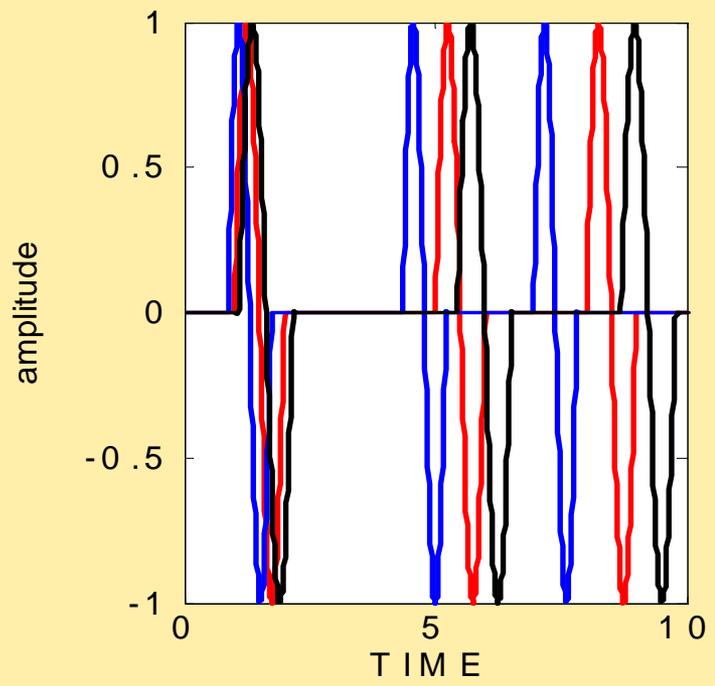
simulation



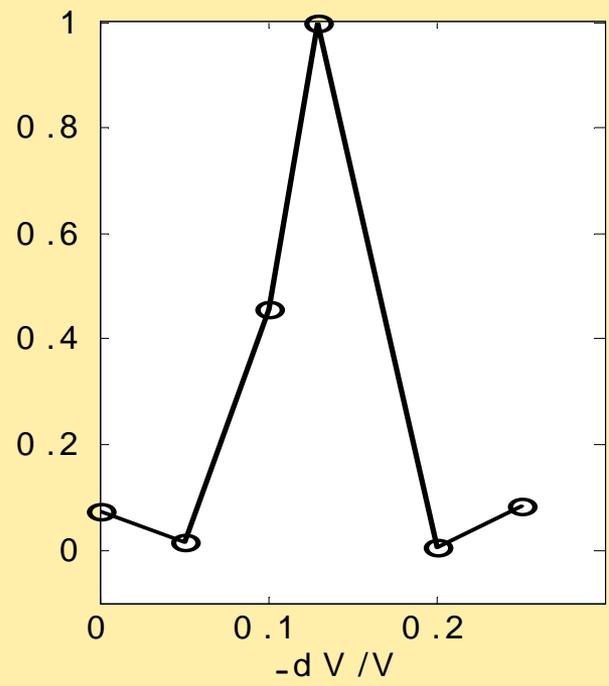
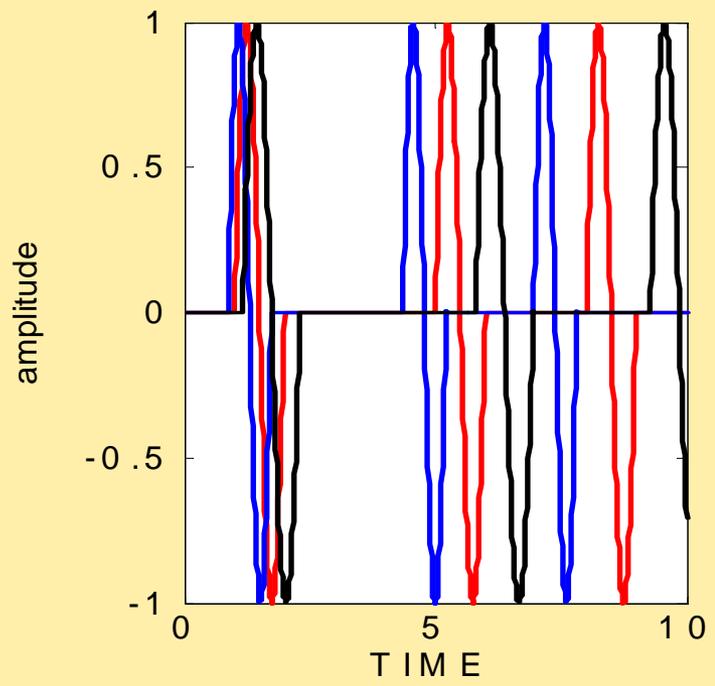
simulation



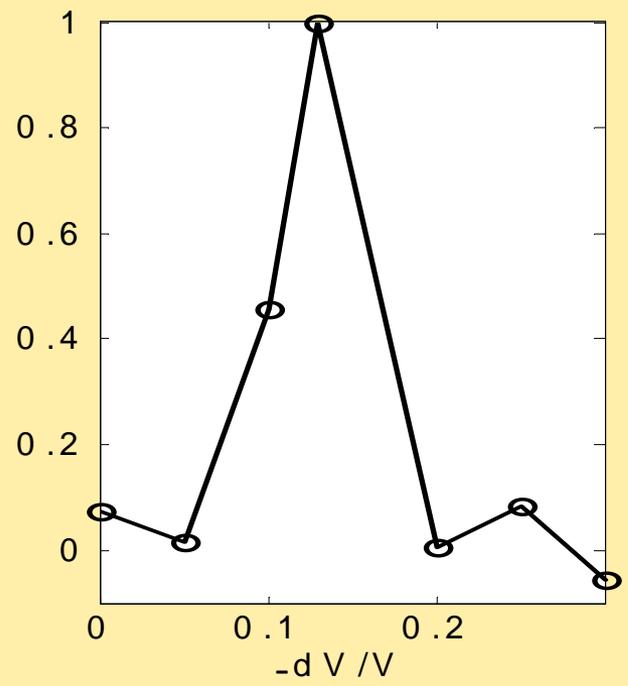
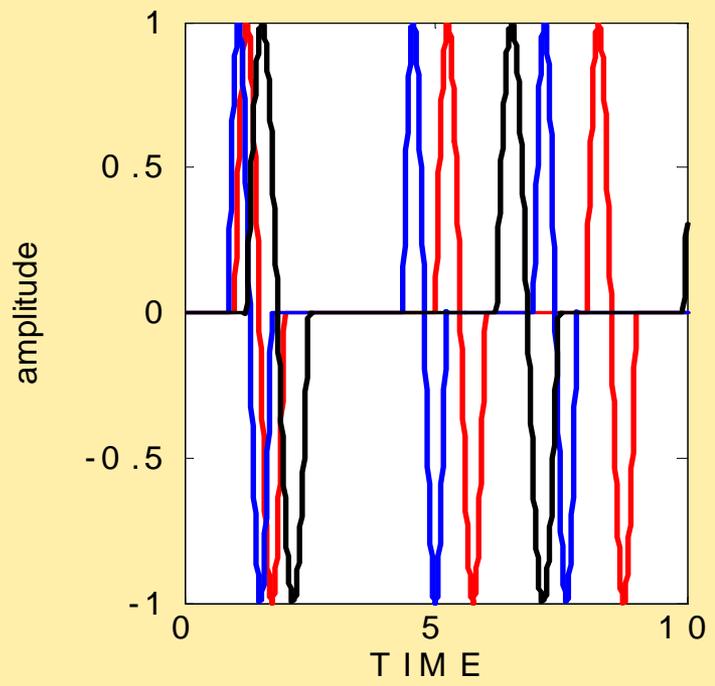
simulation



simulation

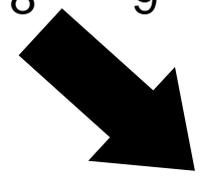
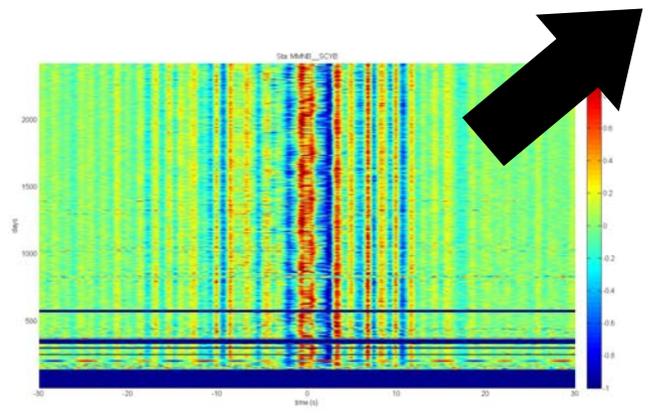
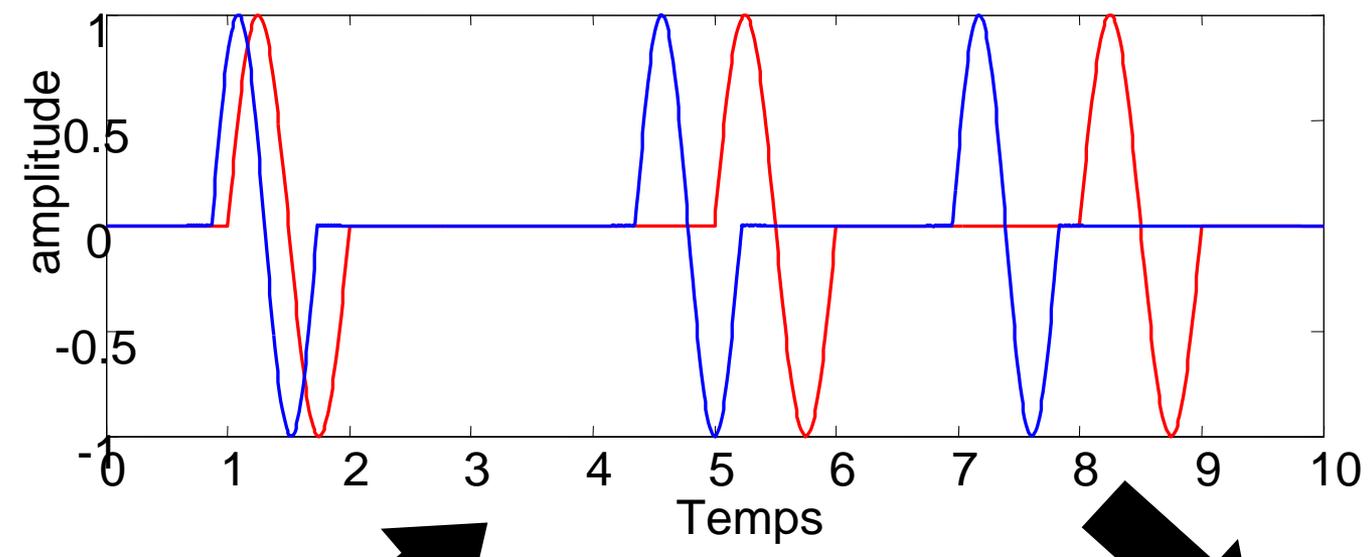


simulation

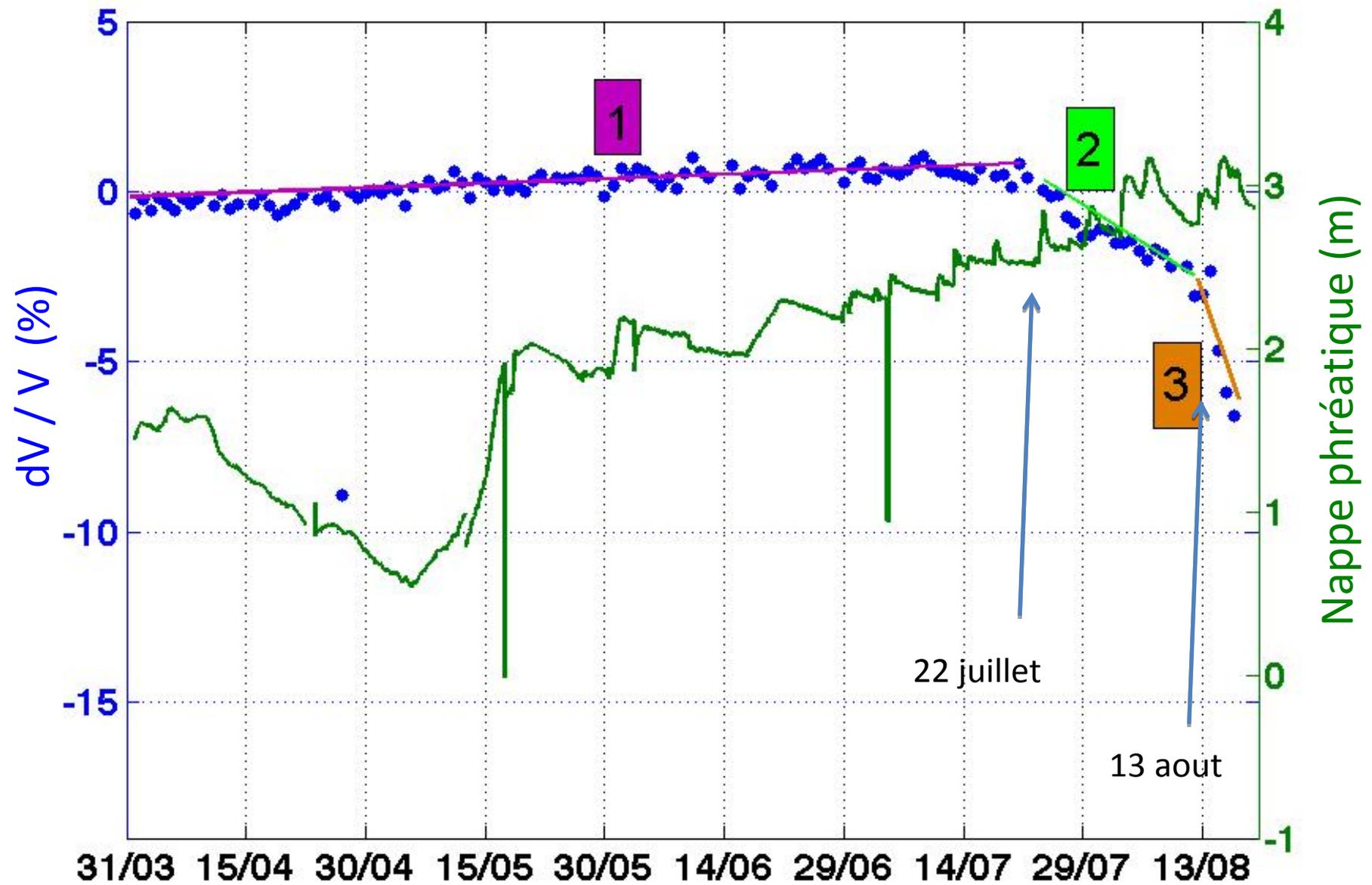


REFERENCE

CURRENT DATE



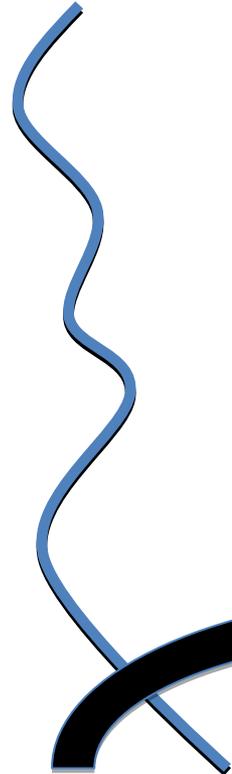
$$dt/t = -dV/V$$



# Suivi (et prévision?) des glissements de terrain



rivière



Capteur A



acquisition

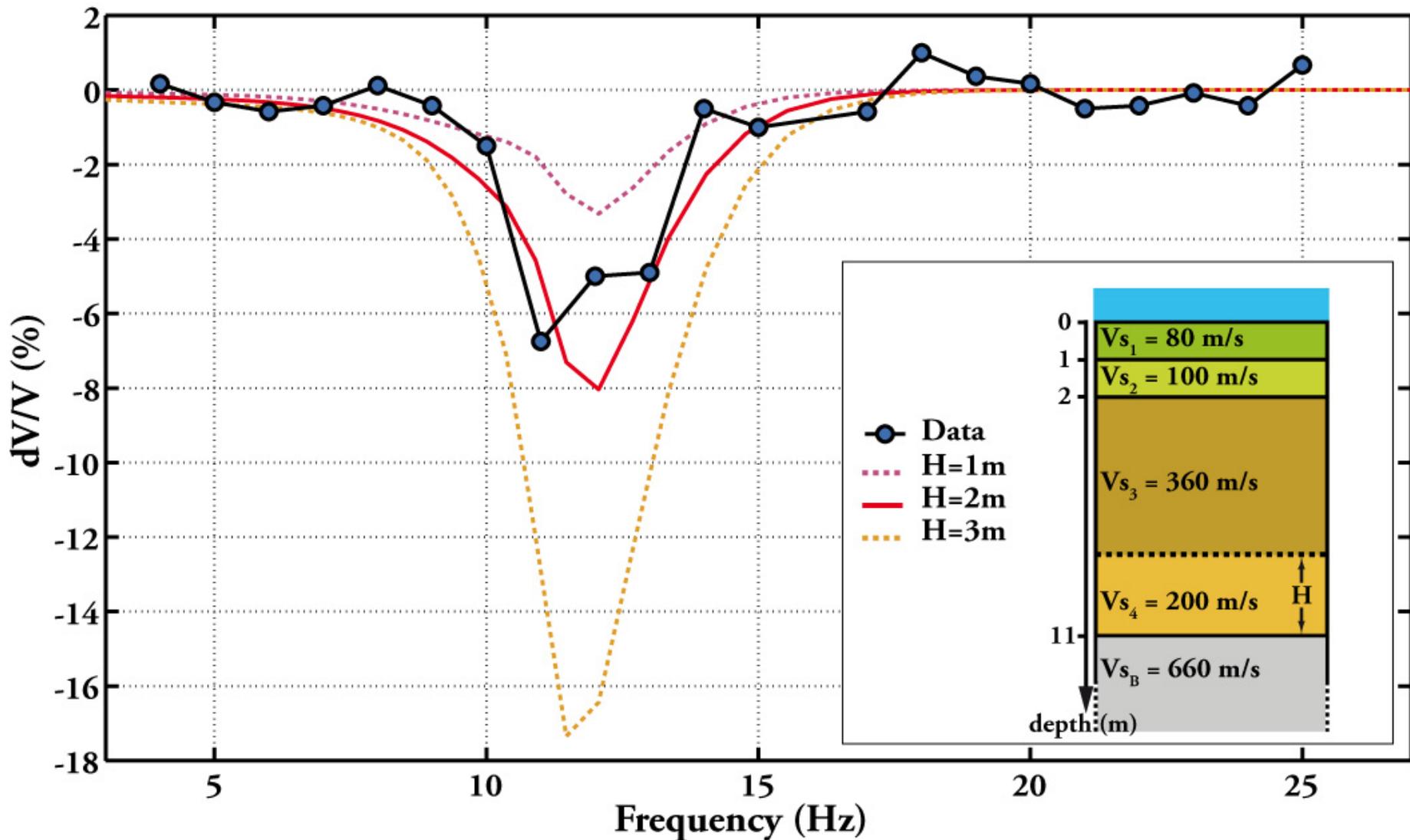


Capteur B



route





Bilan 2009-2010:

- Méthode OK, à généraliser...
- 3 thèses, 1 article (JGR)
- Interaction avec le labo // G. Chambon (IRSTEA)

Perspectives

- Installation 2011: 6 capteurs sismique + GPS, photo, météo, extenso...
- Projet ANR (déposé 2012)