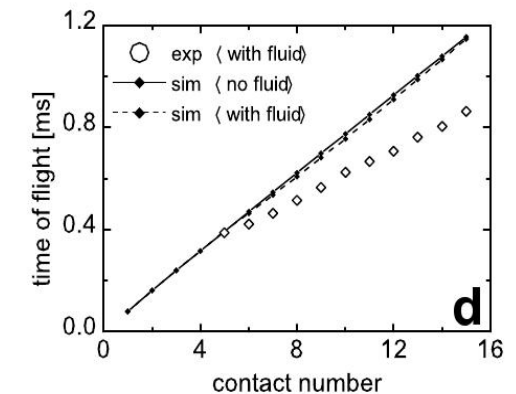
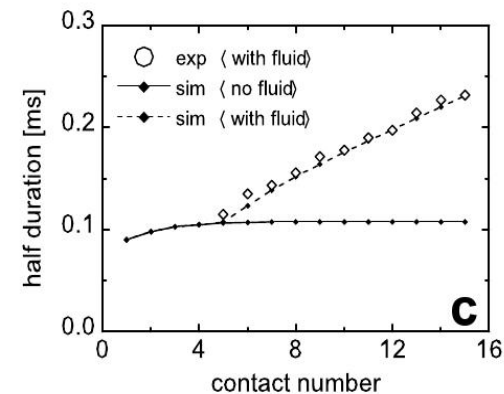
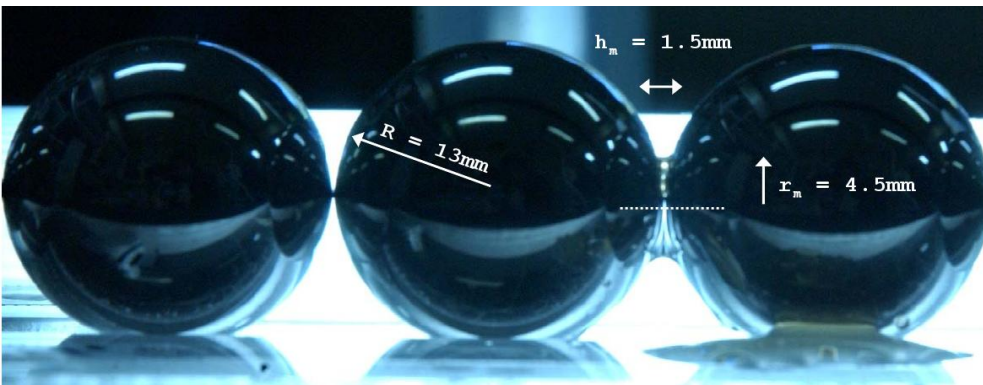
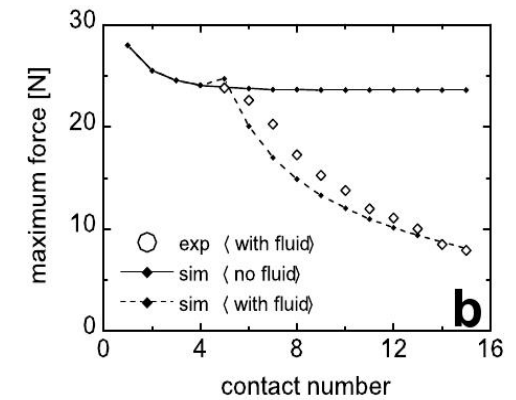
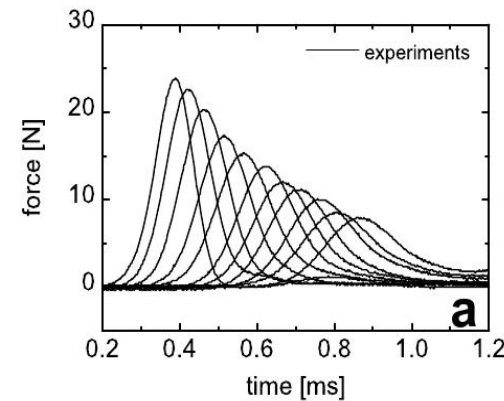


Contact dynamics with an interstitial fluid and wave propagation in wet granular media.

Francisco Santibañez, Stephane Job, Tony Da Silva and Francisco Melo.

ANR-CONICYT: "MicMacGrains"

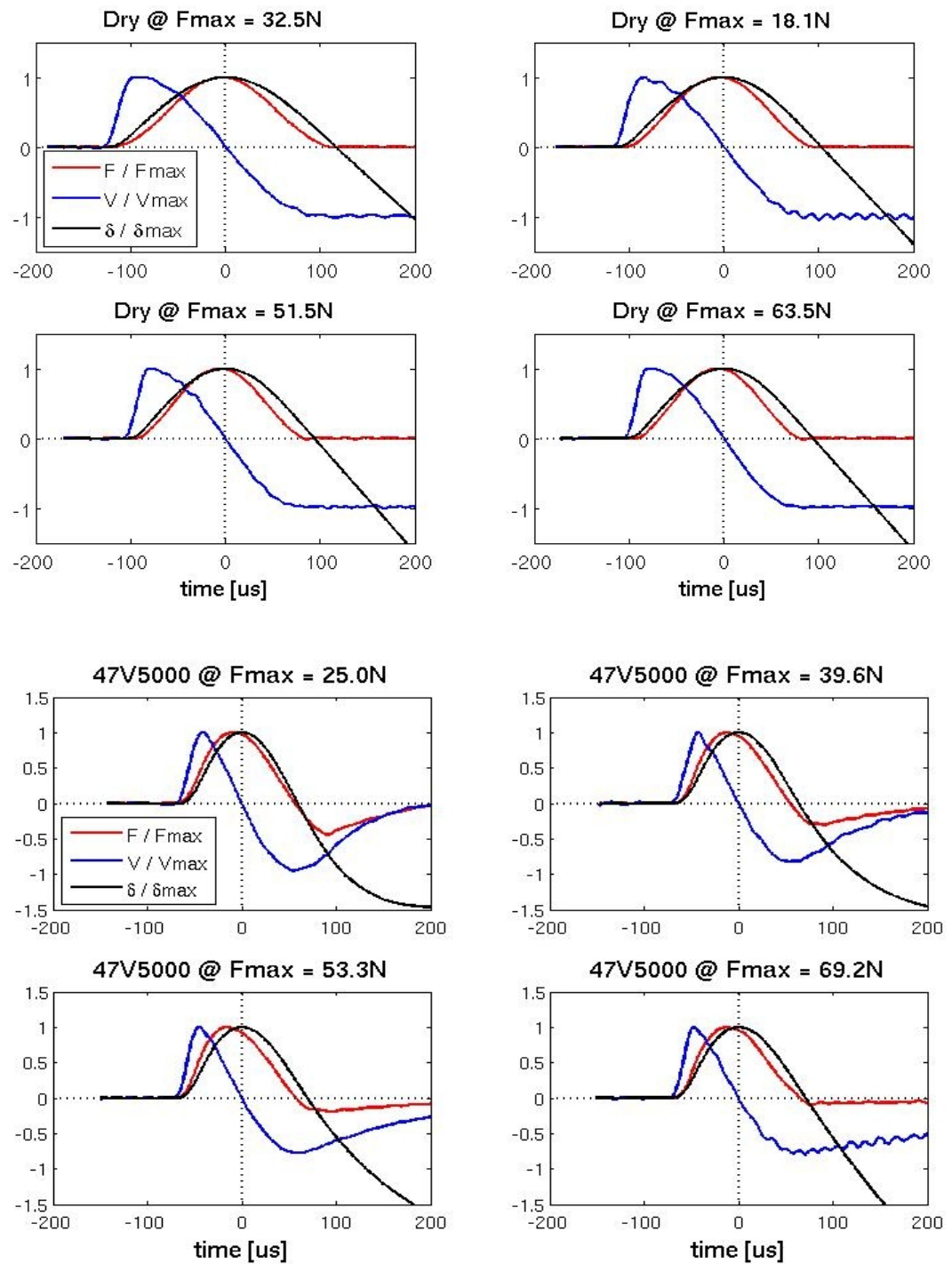
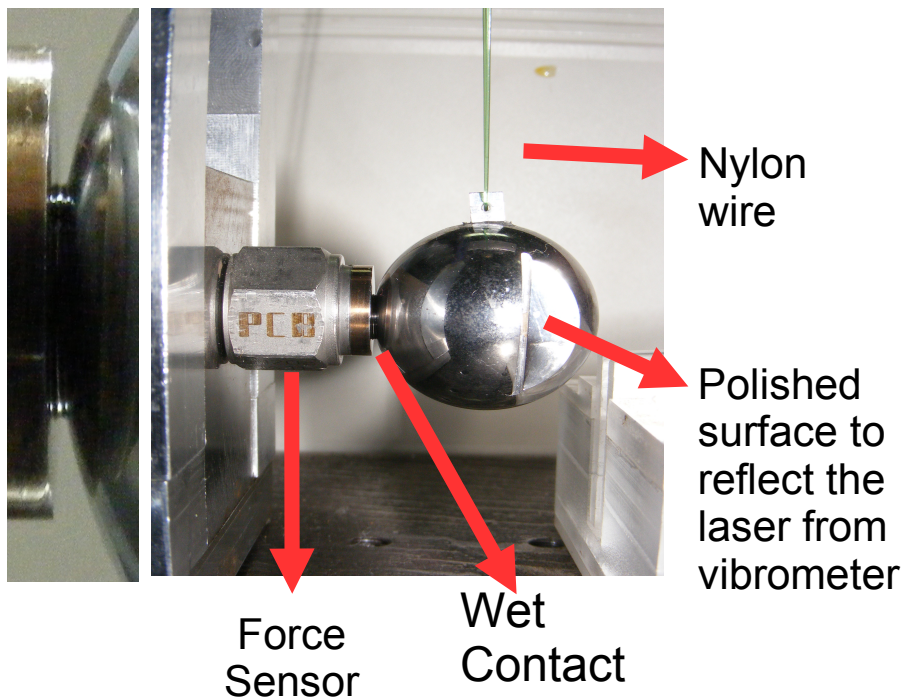
Wave propagation in 1D wet granular media



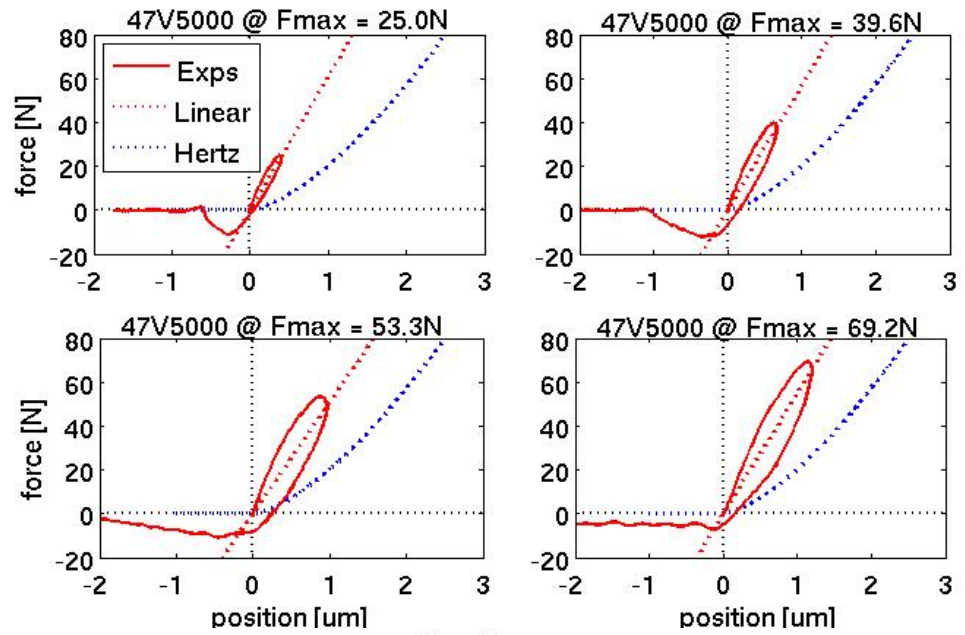
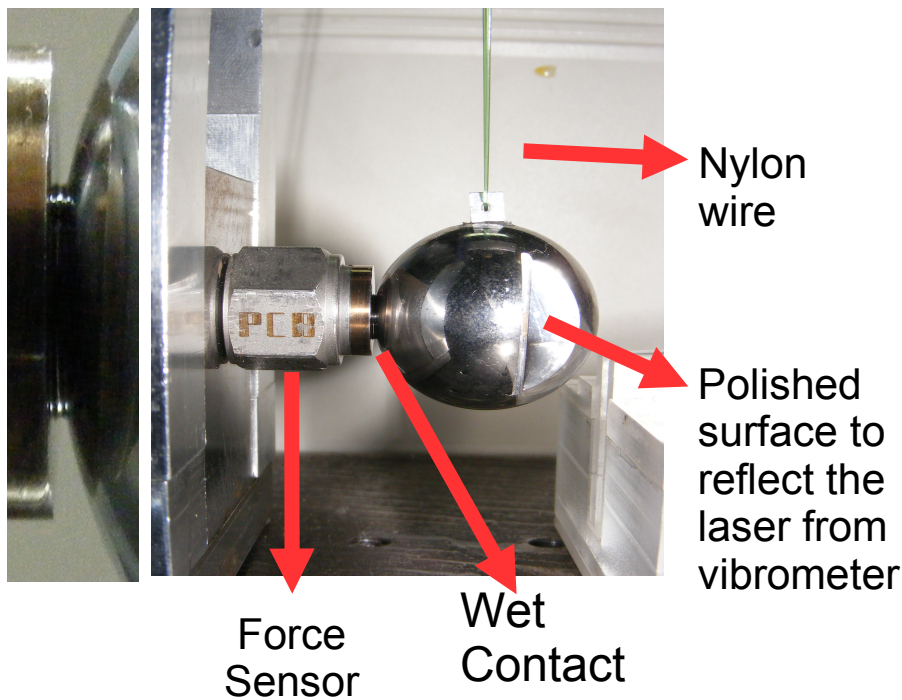
IN AGREEMENT WITH : X. Jia, P. Mills, Sound propagation in dense granular materials, Powders and Grains 2001 for 3D granular materials!!!

Contact dynamics with an interstitial fluid and wave propagation in wet granular media.

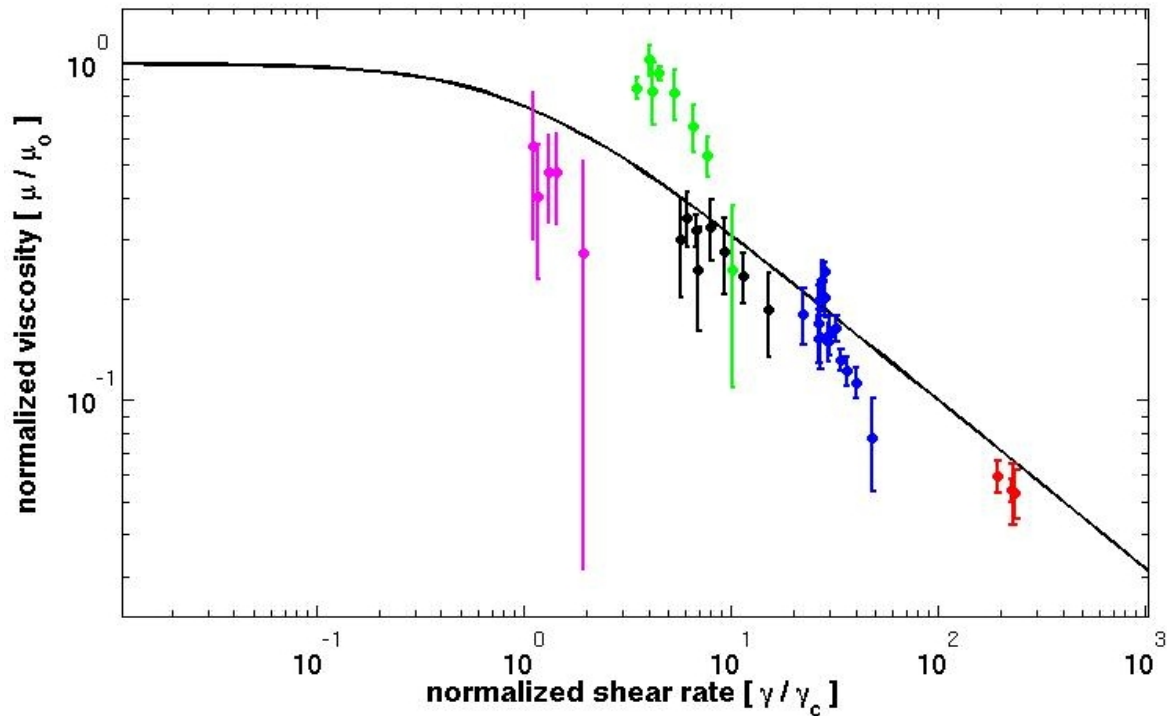
Single wet contact dynamics: Response to impacts



Single wet contact dynamics: Response to impacts



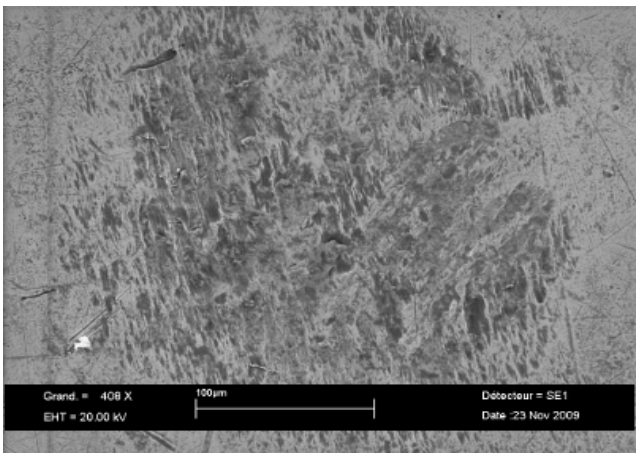
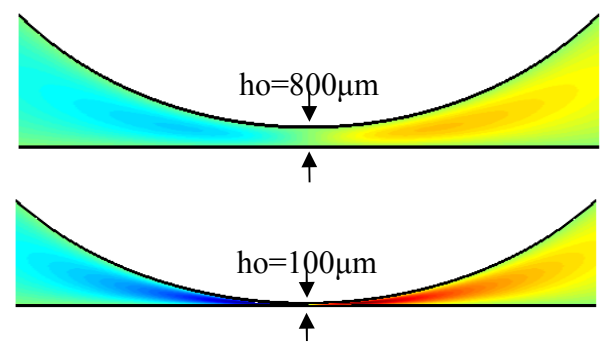
$$\mu = \mu_0 [1 + ((\gamma/\gamma_c)^\beta)]^{-\alpha/\beta} \text{ with } \alpha=1/2 \text{ and } \beta=1.2$$



Contact dynamics with an interstitial fluid and wave propagation in wet granular media.

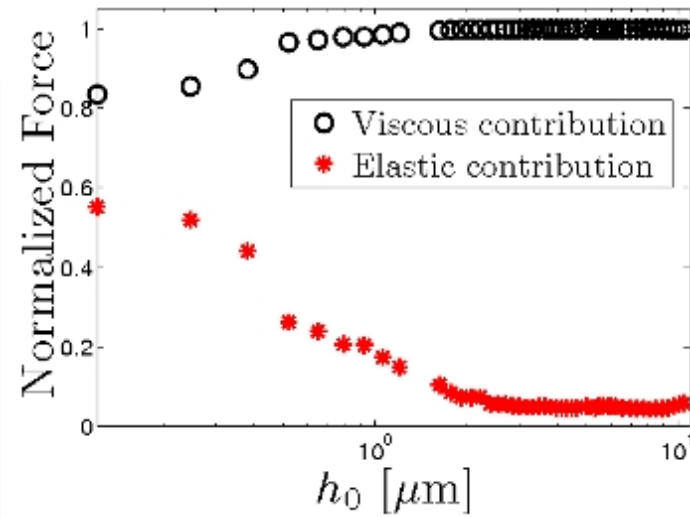
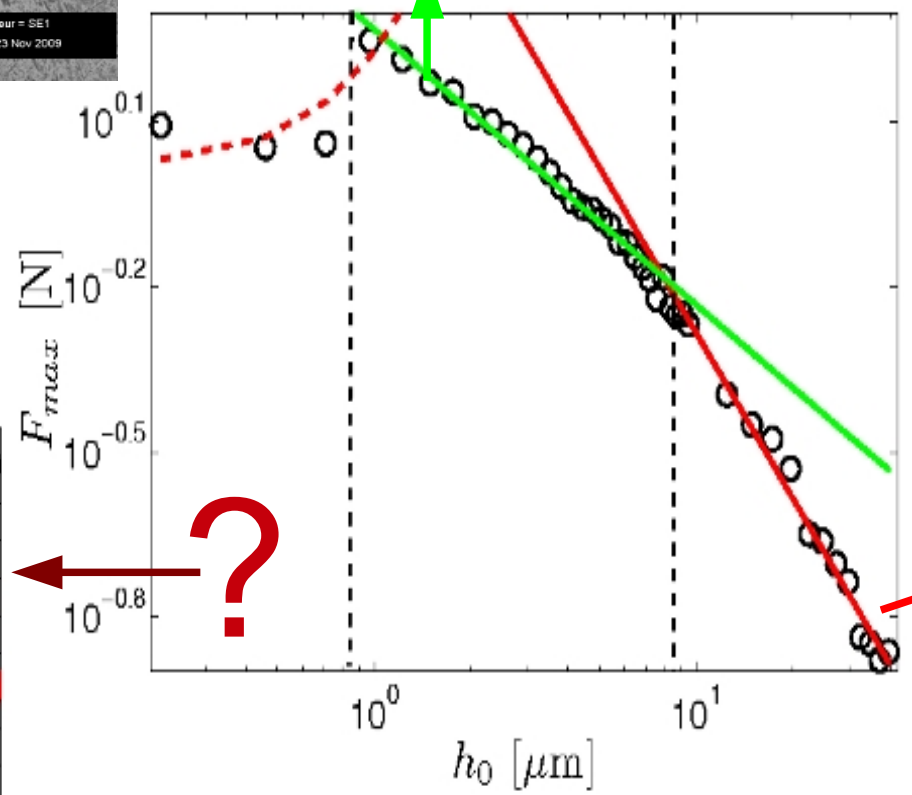
Single wet contact dynamics: Oscillatory approach

$$h = h_0 + \tilde{h} \sin(\omega t); \dot{\gamma} \approx \frac{\dot{h}}{h_0}$$



Size of Asperities :
 $R_q = 0.7 [\mu m]$

Non-Newtonian $F \sim \frac{1}{\sqrt{h_0}}$



Newtonian
 $F \sim \frac{1}{h_0}$

Force Deformation

