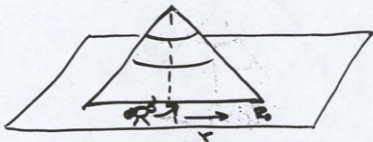
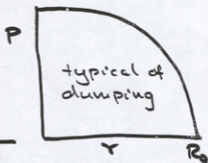
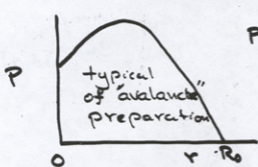


Effects of "History" on Forces at the bottom of a sandpile



r = distance from center
(at bottom)



see S. Savage, J. Goddard

M. Cates, J. Wittmar, J.P. Bouchaud
P. Claudin...

Scaling with Height using Localized Procedure

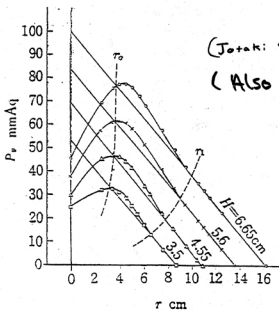
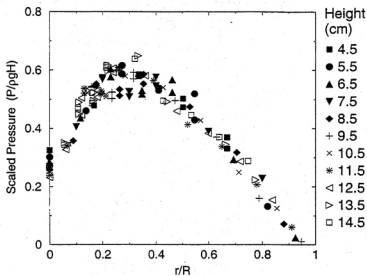
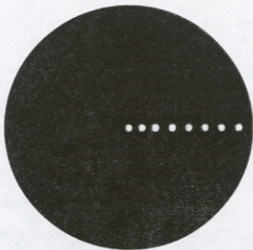


Fig. 3 安息角で堆積した鉛直圧分布,

Pile and Sensor Parameters

Top View

$\sim 10^5$ grains



13 cm

Side View



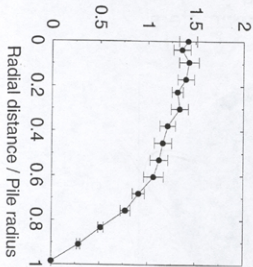
8 cm

0.5 " Steel Plate

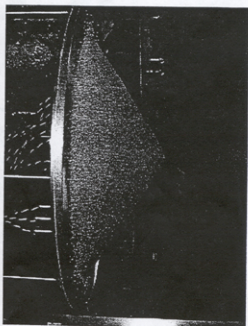
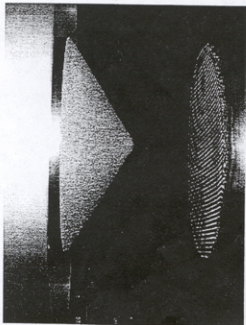
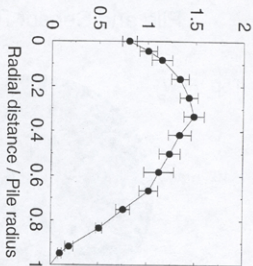
Max displacement of sensor: 0.8μ

Max displacement / Pile height $\sim 10^{-5}$

Scaled Pressure (a. u.)

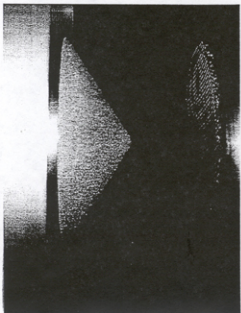
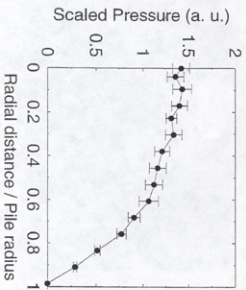
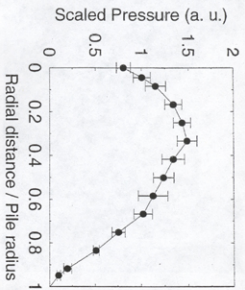


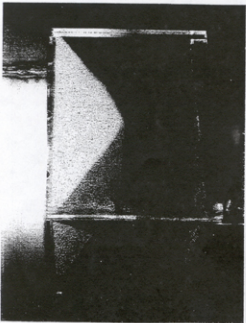
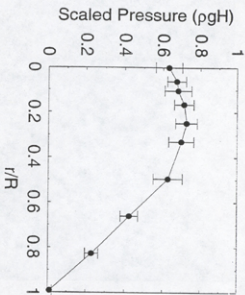
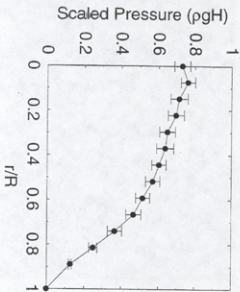
Scaled Pressure (a. u.)



Vanel, Howell, Clément, 1993

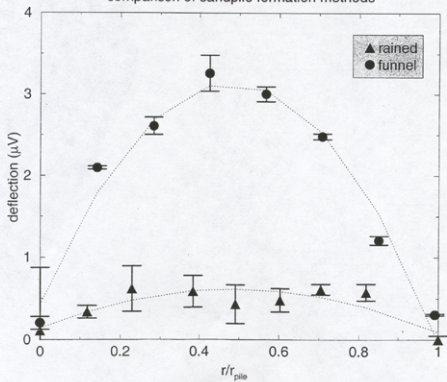
To appear ...



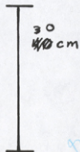
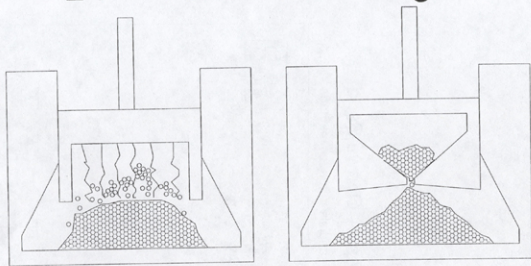


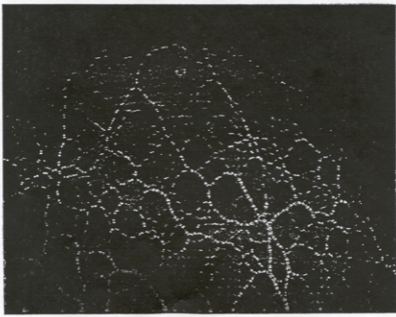
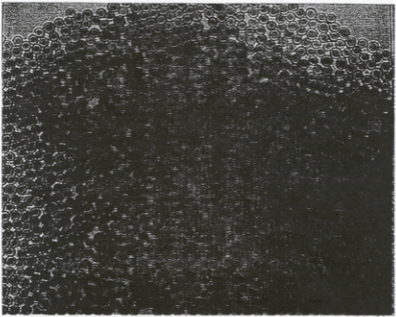
Shear Stress – Ottawa Sand

comparison of sandpile formation methods

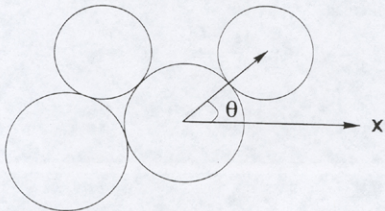


2-D Photoelastic Wedge





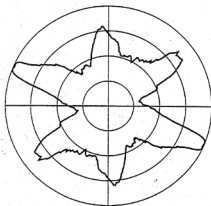
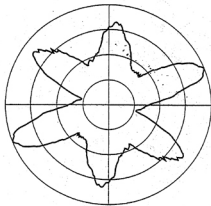
Nearest Neighbor Contact Angle Distribution



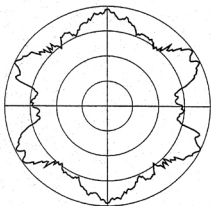
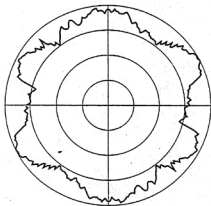
1. Record nearest neighbor angles for each particle.
2. Form **histogram** and display in polar coordinates

Nearest Neighbor Contact Angle Distributions

Localized Procedure



Raining Procedure

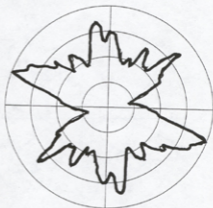
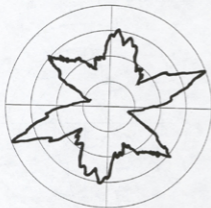


Left

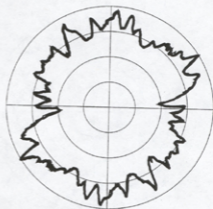
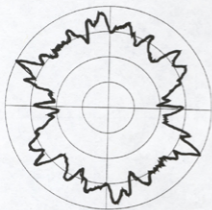
Right

Stress Chain Angle Distributions

Localized Procedure



Raining Procedure



Left

Right

from P. Claudin thesis 99
simulations by
J. J. Moreau 99

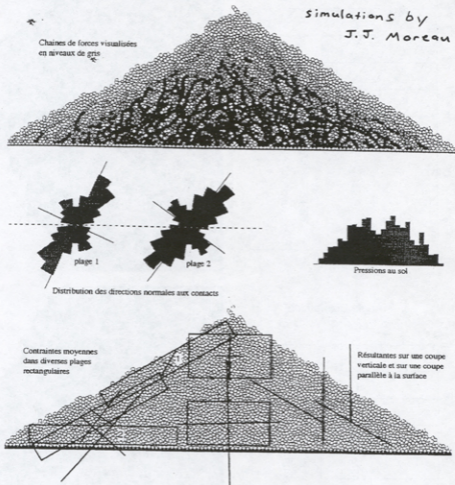


FIG. 2.7 - Jean-Jacques Moreau a appliqué sa méthode Contact Dynamics au cas du tas de sable. La figure du haut montre la structure interne des voûtes de ce tas. Ces voûtes ont une orientation moyenne à peu près constante très bien marquée (la distribution angulaire des directions normales aux contacts est très anisotrope). Une telle structure crée une dépression à la verticale du sommet.

