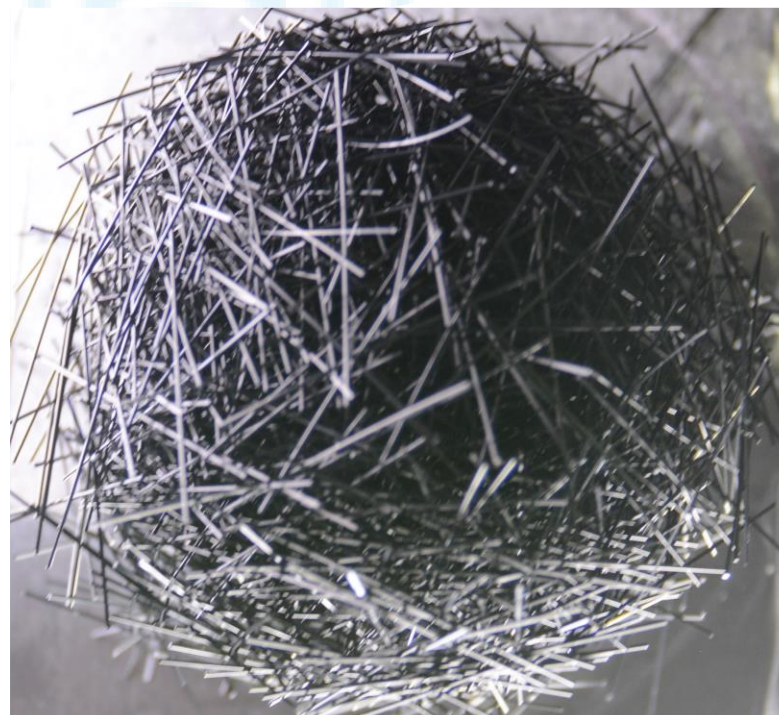


VIBRATED LAYERS OF SLENDER FIBERS



Moussa Abdourahamane Abdoul Hakim

Supervised by:

Pierre Jop

Martin Coux

Olivier Pouliquen

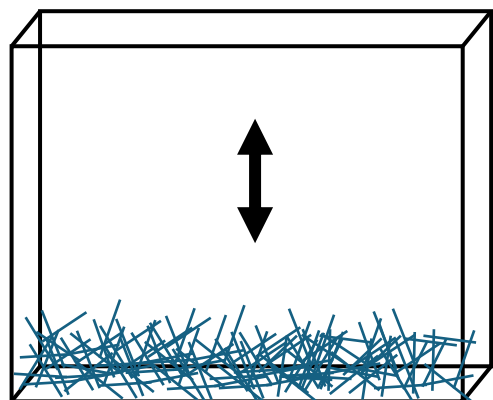
Joël Marthelot

Nylon flexible fibers of
aspect ratio 25-100.

Response of a fiber assembly to mechanical solicitations?

VERTICAL VIBRATION OF FLEXIBLE FIBERS

Fibers of low aspect ratio r



- Quasi-2D cell
- Bed thickness ≈ 1 cm

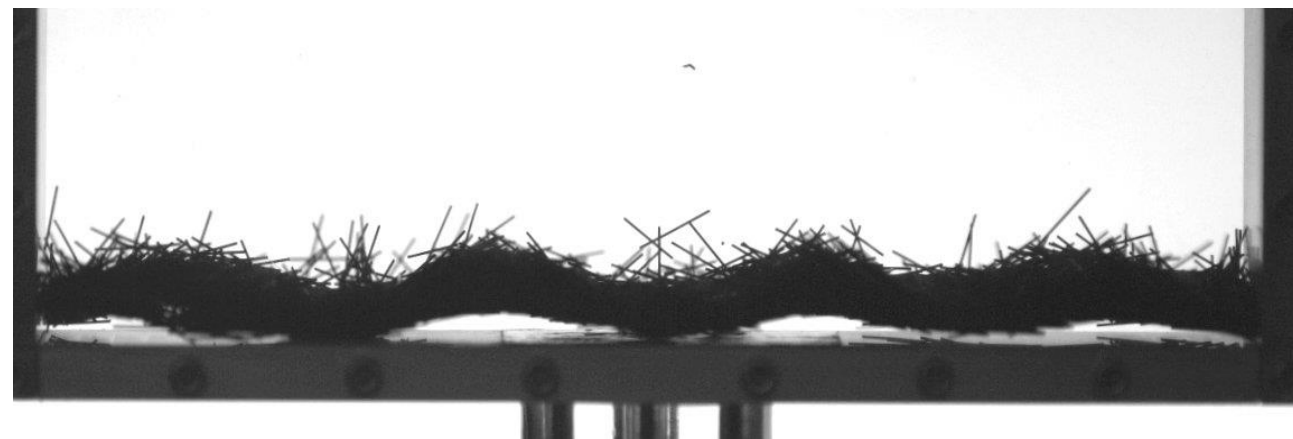
$$z = A_{sh} \cdot \sin(2\pi ft)$$

$$f = 10 \text{ Hz} - 35 \text{ Hz}$$

$$A_{sh} = 0 - 1 \text{ cm}$$

5 cm

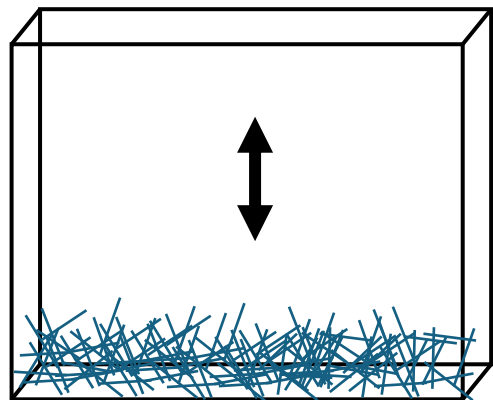
$r = 25$



$$f = 20 \text{ Hz}, A_{sh} = 2 \text{ mm}$$

VERTICAL VIBRATION OF FLEXIBLE FIBERS

Fibers of high aspect ratio r



- Quasi-2D cell
- Bed thickness ≈ 1 cm

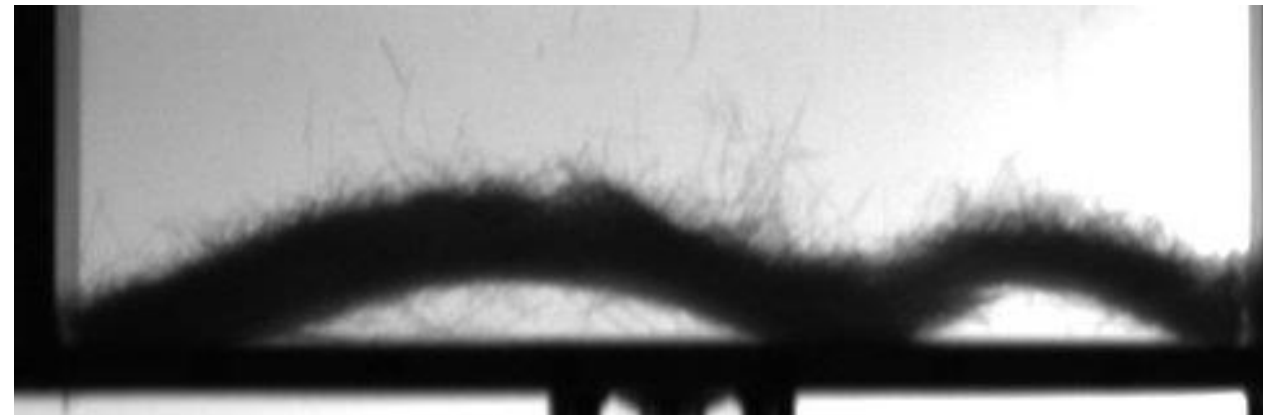
$$z = A_{sh} \cdot \sin(2\pi ft)$$

$$f = 10 \text{ Hz} - 35 \text{ Hz}$$

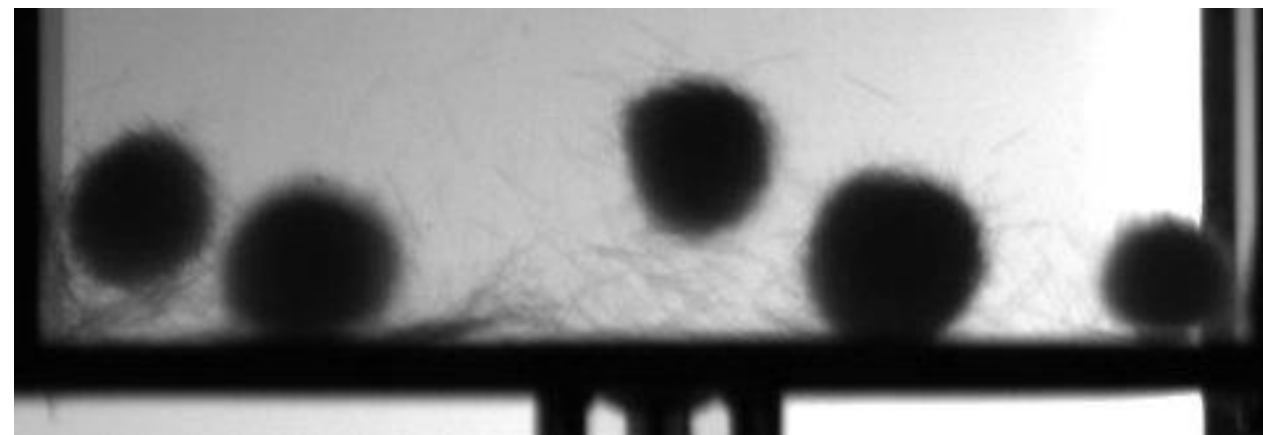
$$A_{sh} = 0 - 1 \text{ cm}$$

5 cm

$r = 100$



$f = 30 \text{ Hz}, A_{sh} = 2.4 \text{ mm}$



$f = 15 \text{ Hz}, A_{sh} = 6 \text{ mm}$

Formation and properties of aggregates ?