

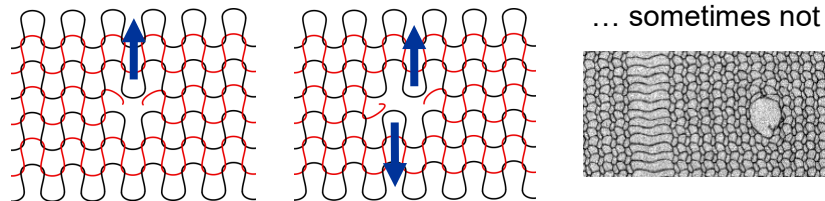
Laddering in a knitted fabric

Audrey Steinberger

- A knitted fabric = a network of interlaced loops (stitches)

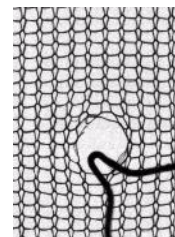
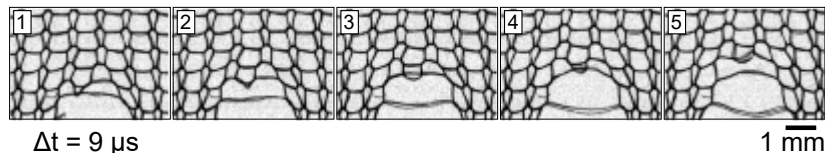
Topological stability

- Breaking the thread sometimes induces laddering...



Topologically controlled ladder direction

Image sequence of a ladder formation



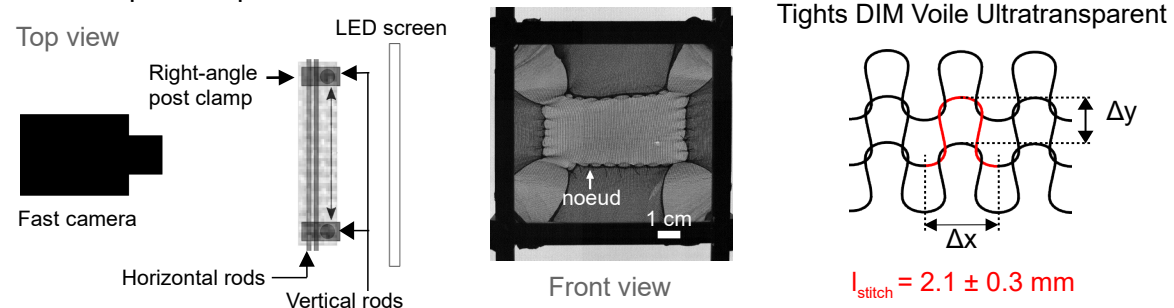
Watch
the movie



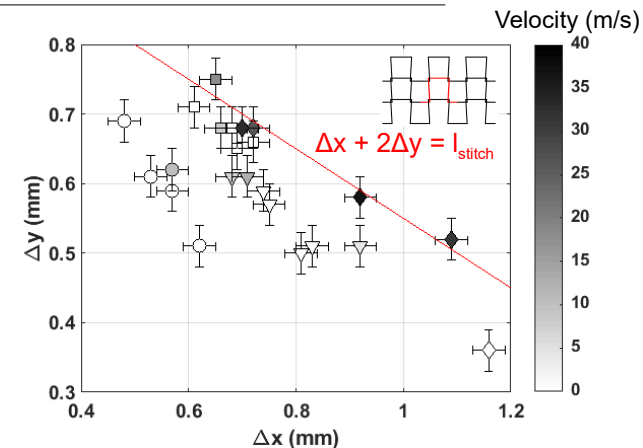
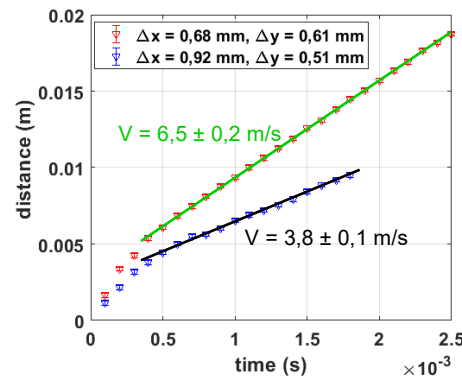
110 000 fps played at 5 fps

- Propagation threshold ?
- Propagation velocity ?

- Setup & sample



- Results



Take home

- Laddering only under strong biaxial stretch
- Laddering probability: elasticity vs friction ?
- Speed up to 40 m/s !
- Outlook : 2-axis testing machine with home-made samples