



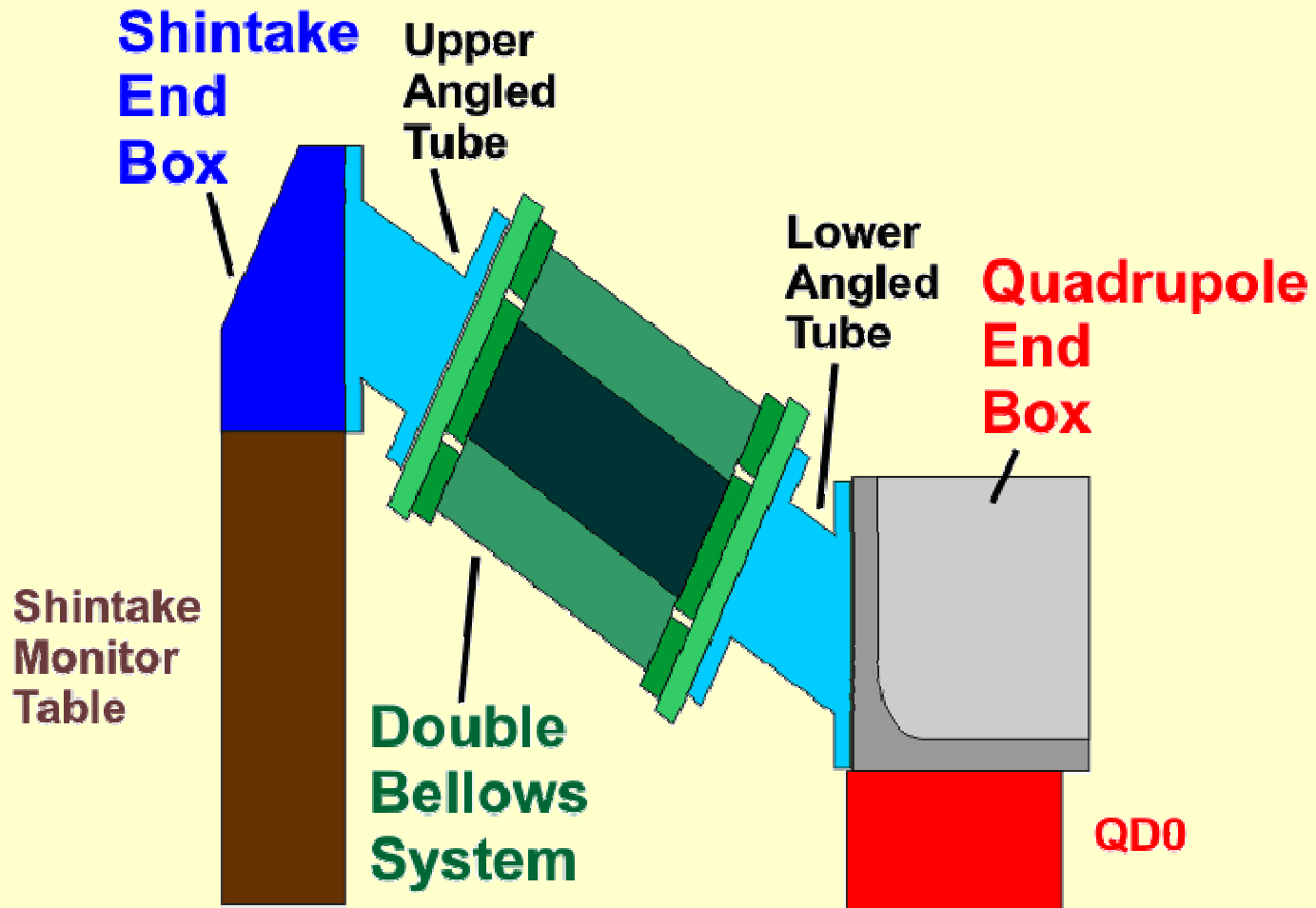
MONALISA

Double Bellow System

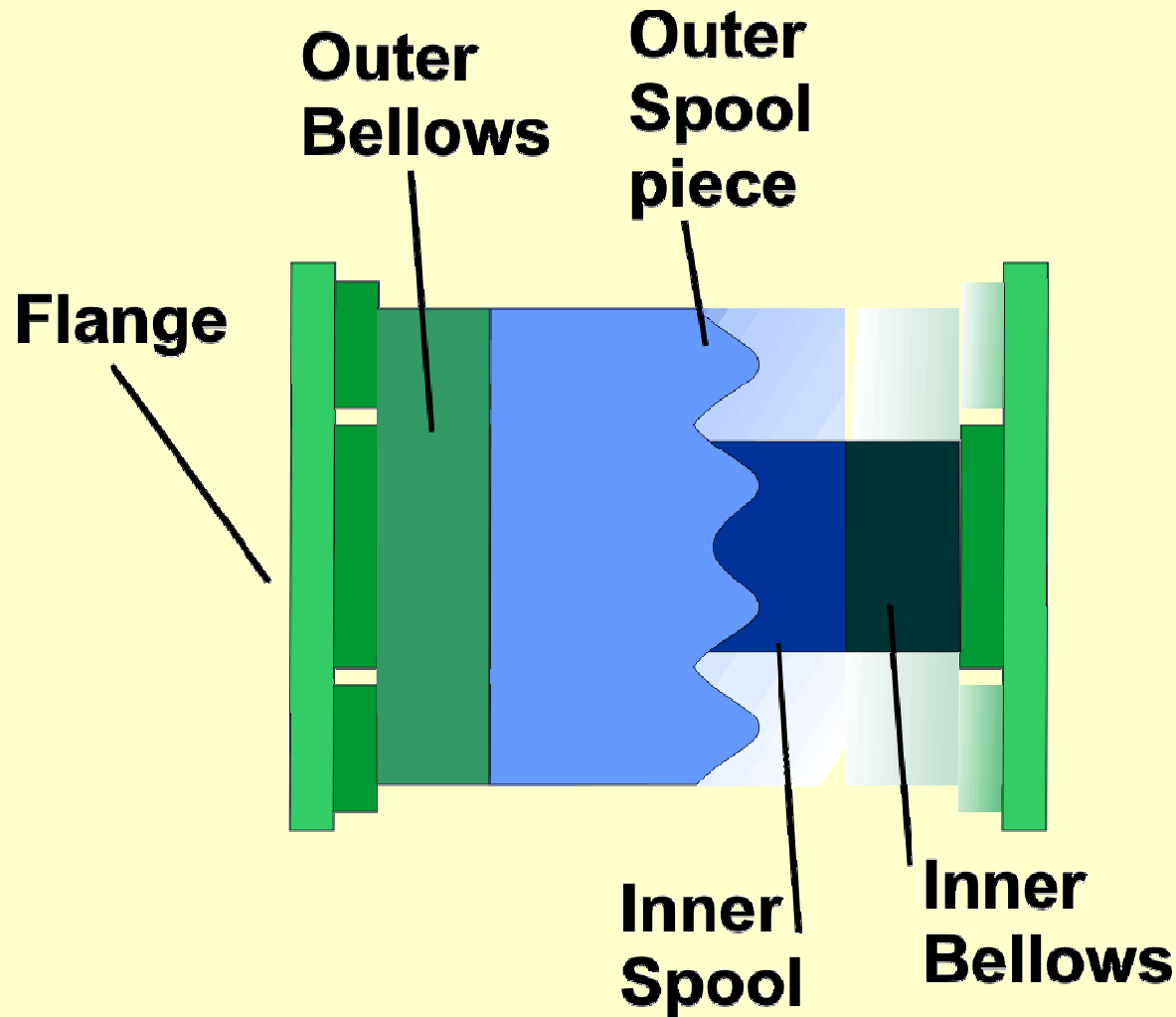
Forces test results

Oxford: June 2009

MONALISA vacuum enclosure



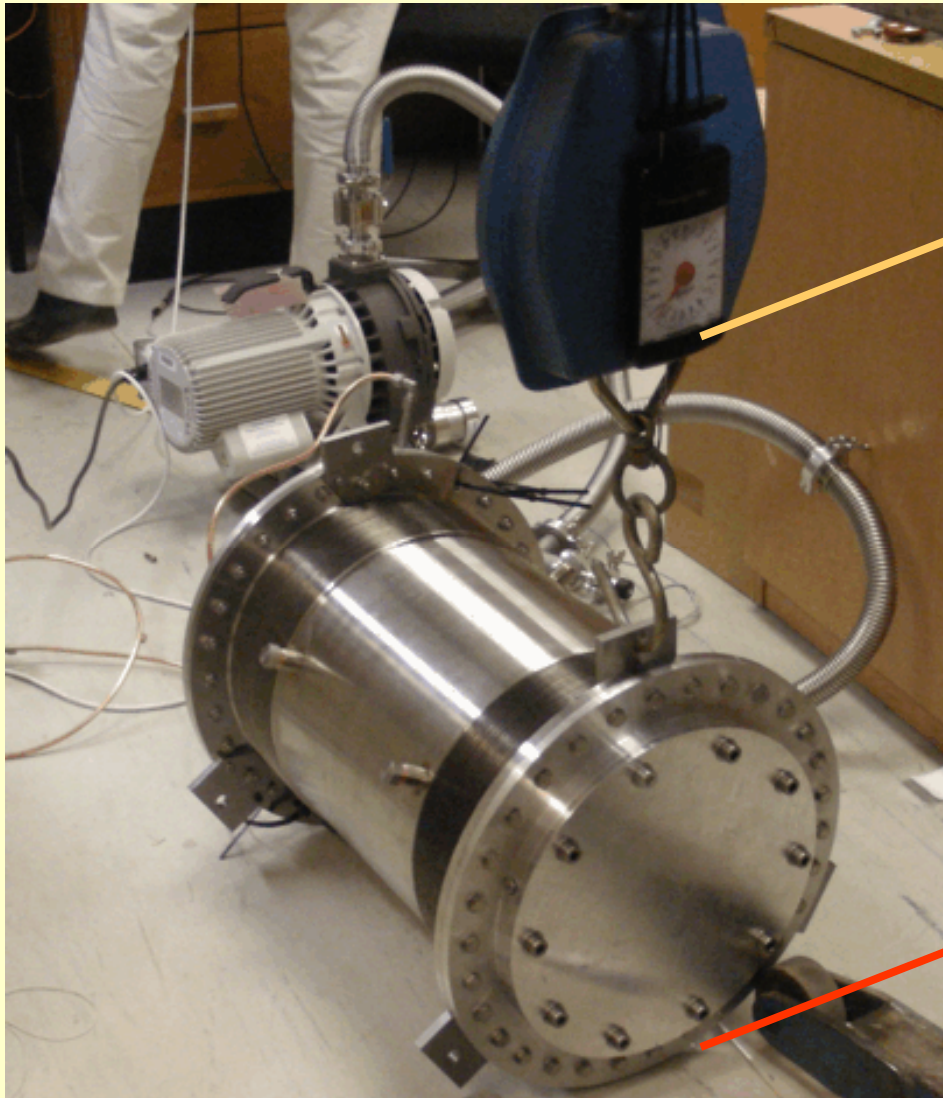
Double bellows system (DBS)



Test programme

- Lateral spring constant
- Longitudinal forces (free)
- Longitudinal forces (attached to frame)

Lateral spring constant set-up



Force gauge under
bias tension

Lateral spring constant

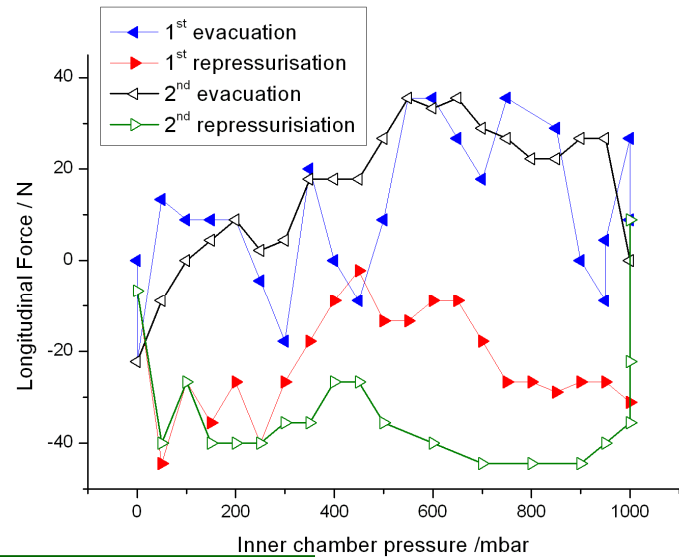
Ambient pressure 35 ± 5 N/mm

Inner Evacuated 35 ± 5 N/mm

Double bellows
off floor at one end

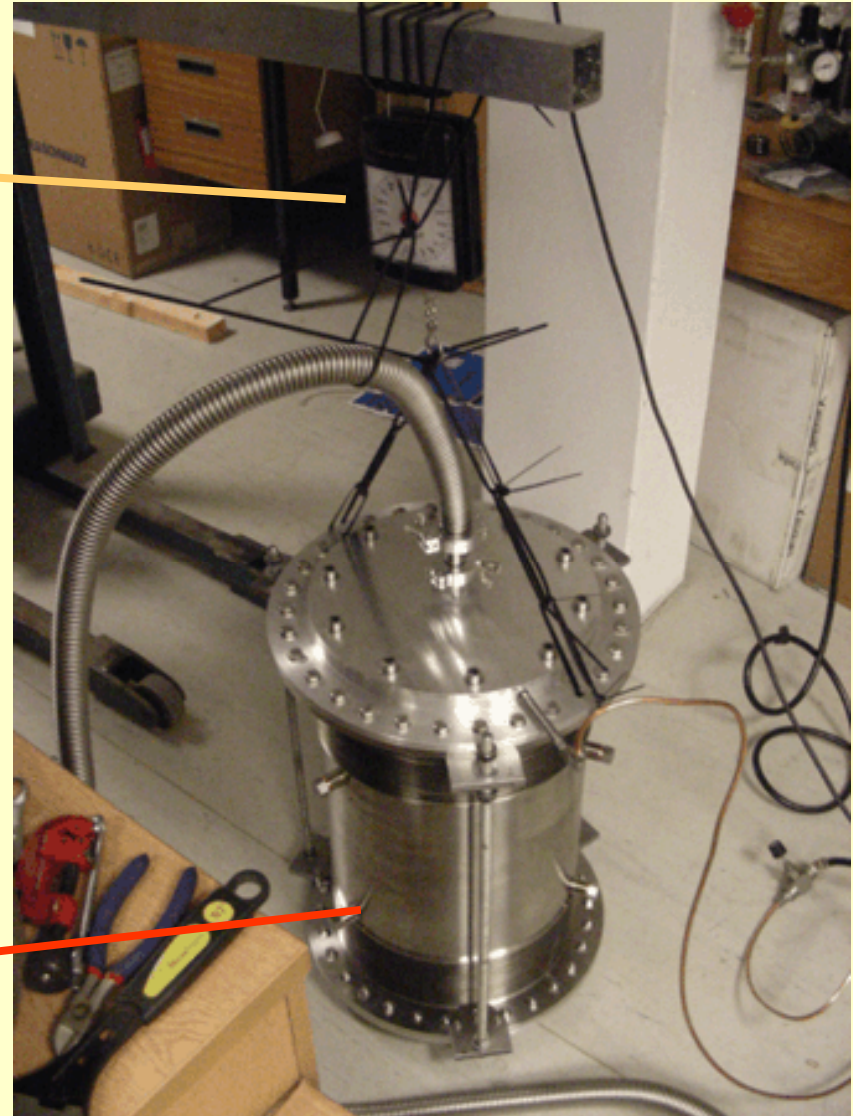
Longitudinal forces (free DBS)

Force gauge under
bias tension

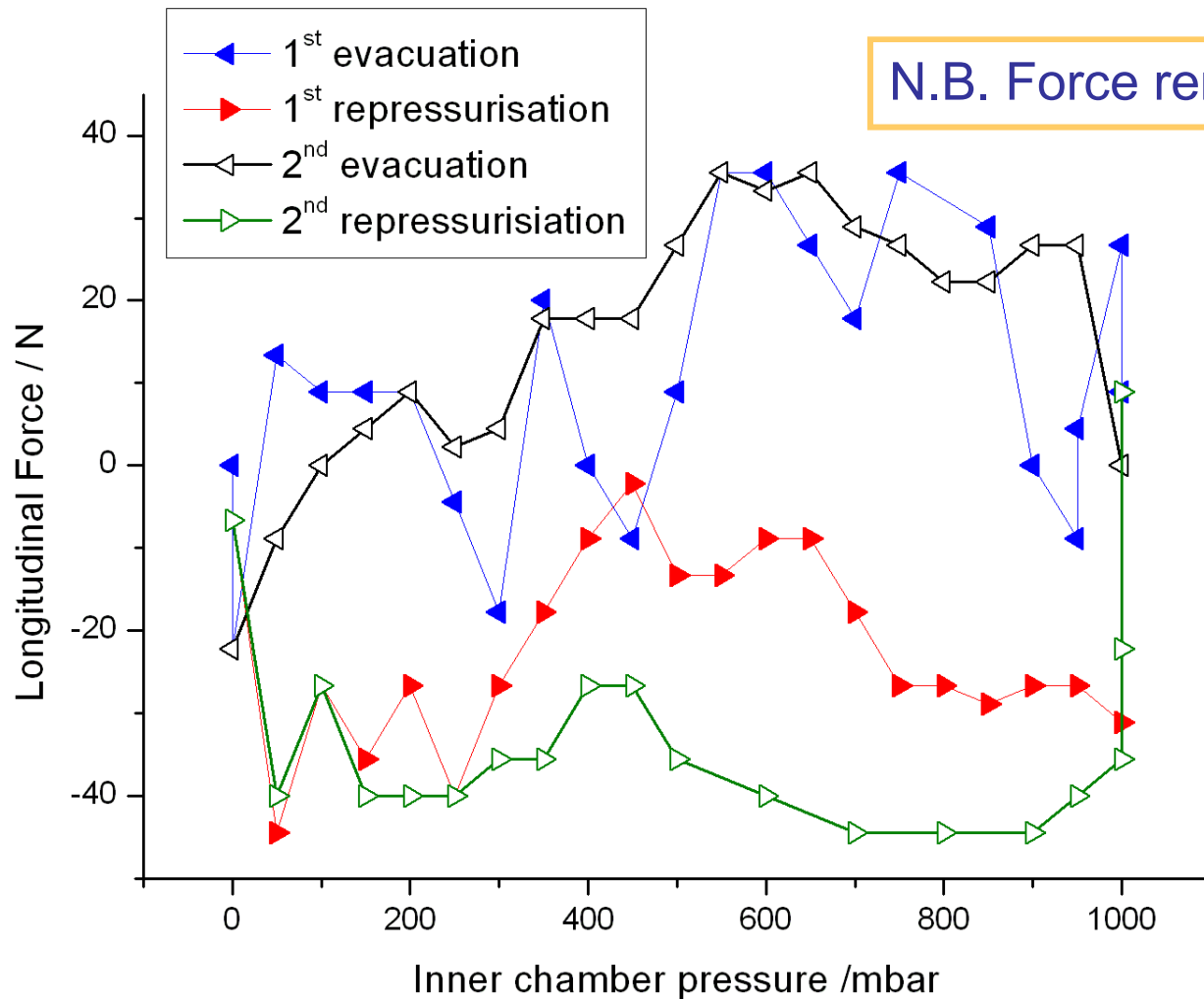


(see next slide)

Double bellows upright
resting on floor on one end



Longitudinal forces (free DBS)

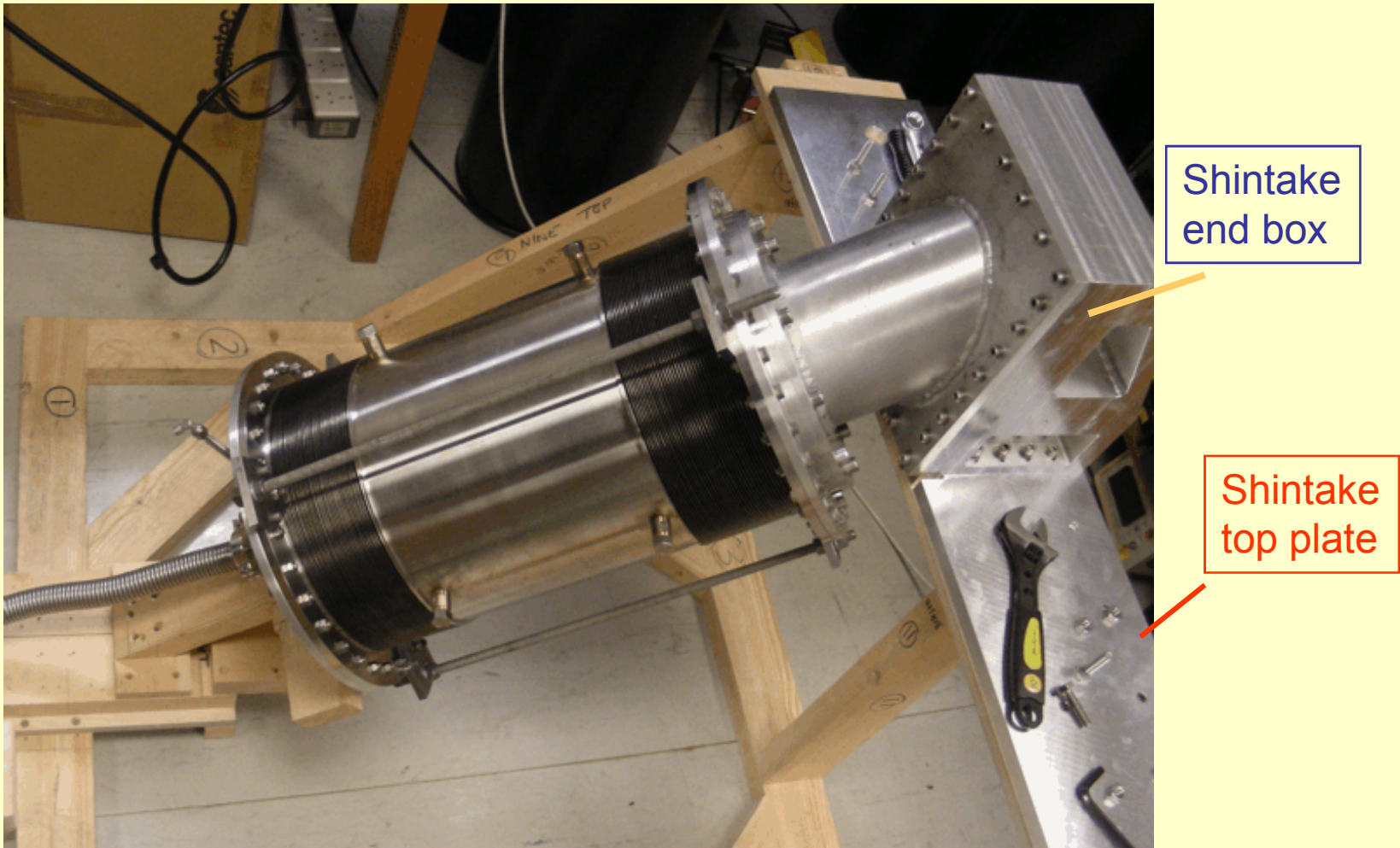


N.B. Force remains within ± 50 N

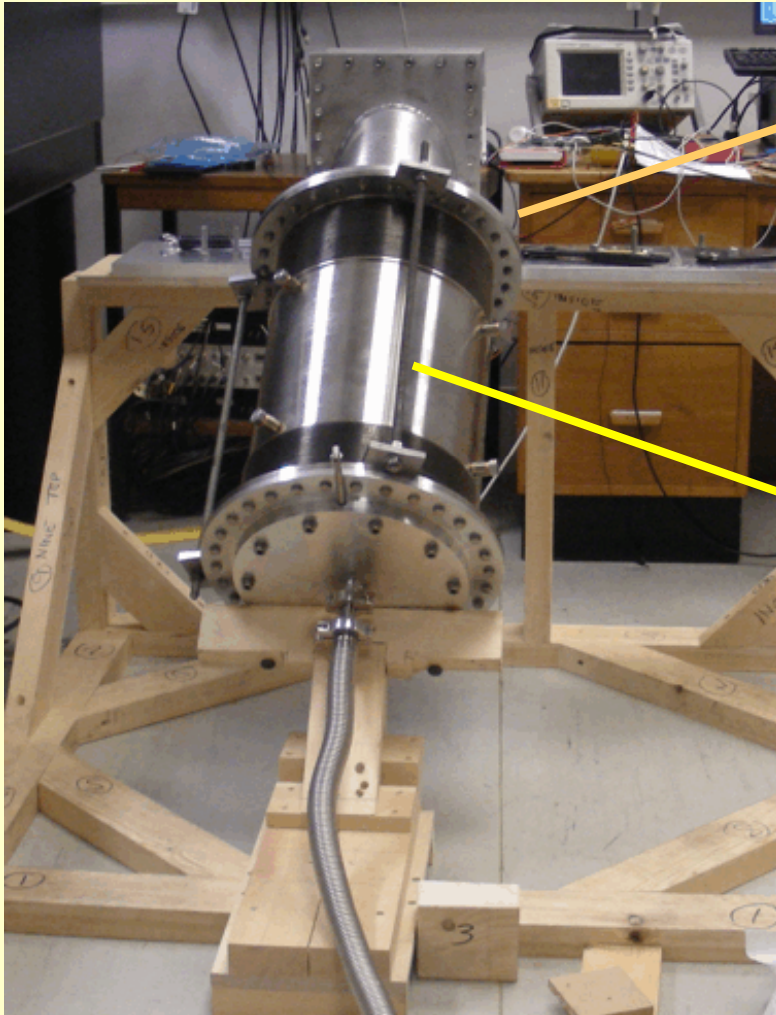
Longitudinal forces (in-situ)

- We assembled parts into wooden frame
 - (Quadrupole end box not fitted)
- Placed force sensor
 - on downstream face of “Shintake monitor”
 - measures F in (electron beam) z direction
- Set up shown in next slide

Longitudinal forces (in-situ): Set-up



Longitudinal forces (in-situ): Set-up



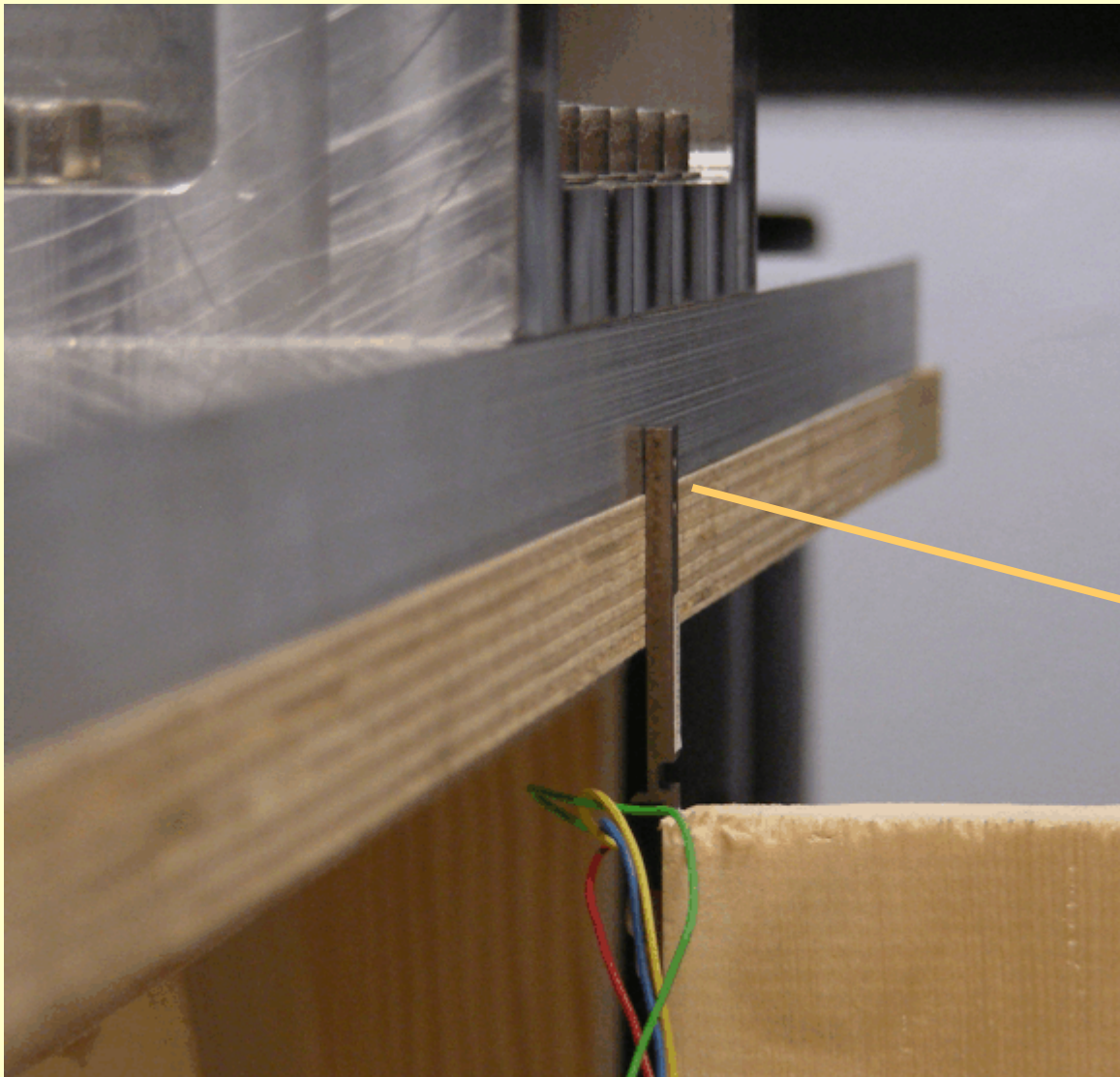
Strain sensor (see next slide)

- mounted behind Shintake monitor plate
- mounted on independent block

Mounting rods

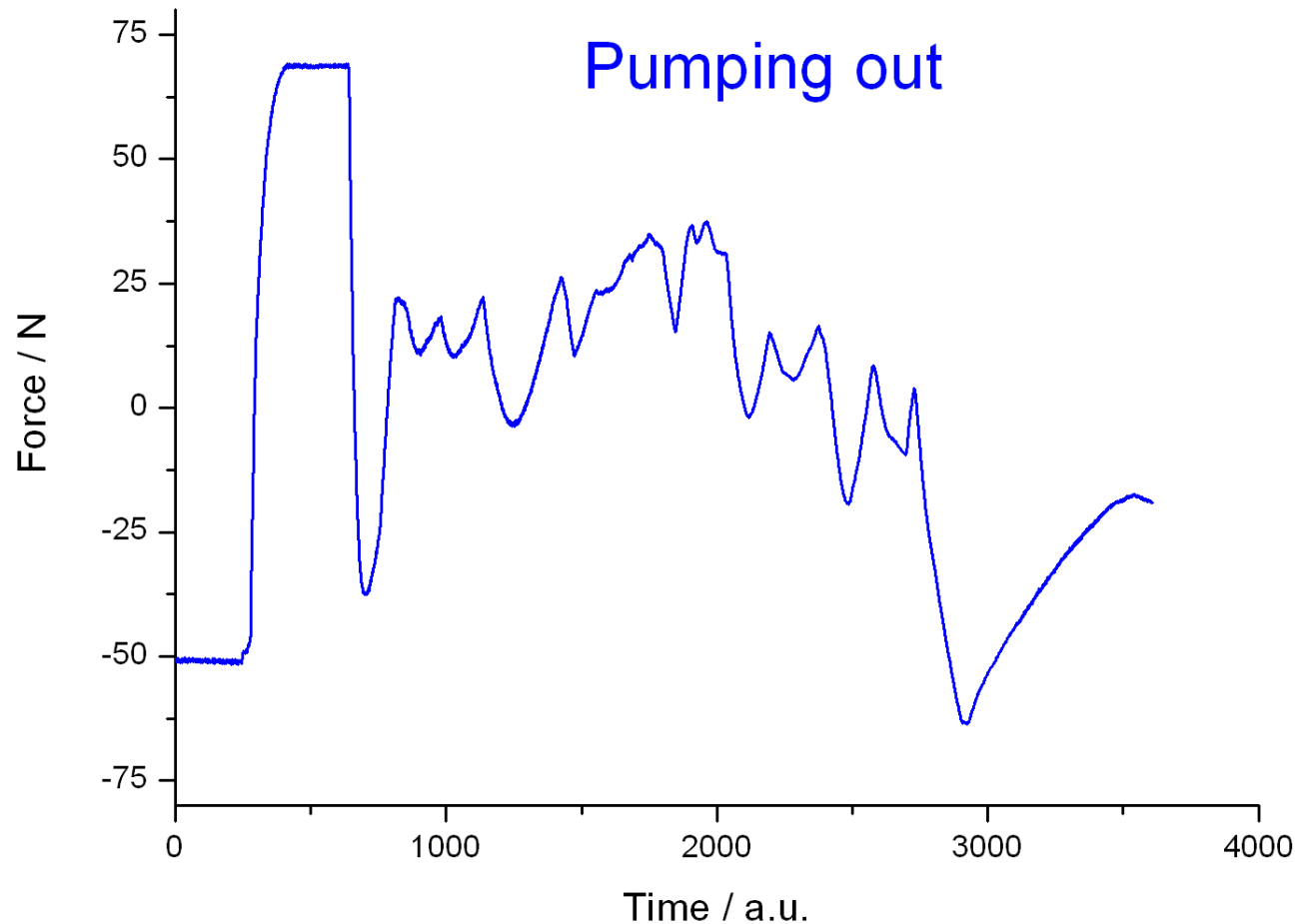
- removed for forces test

Force sensor close-up

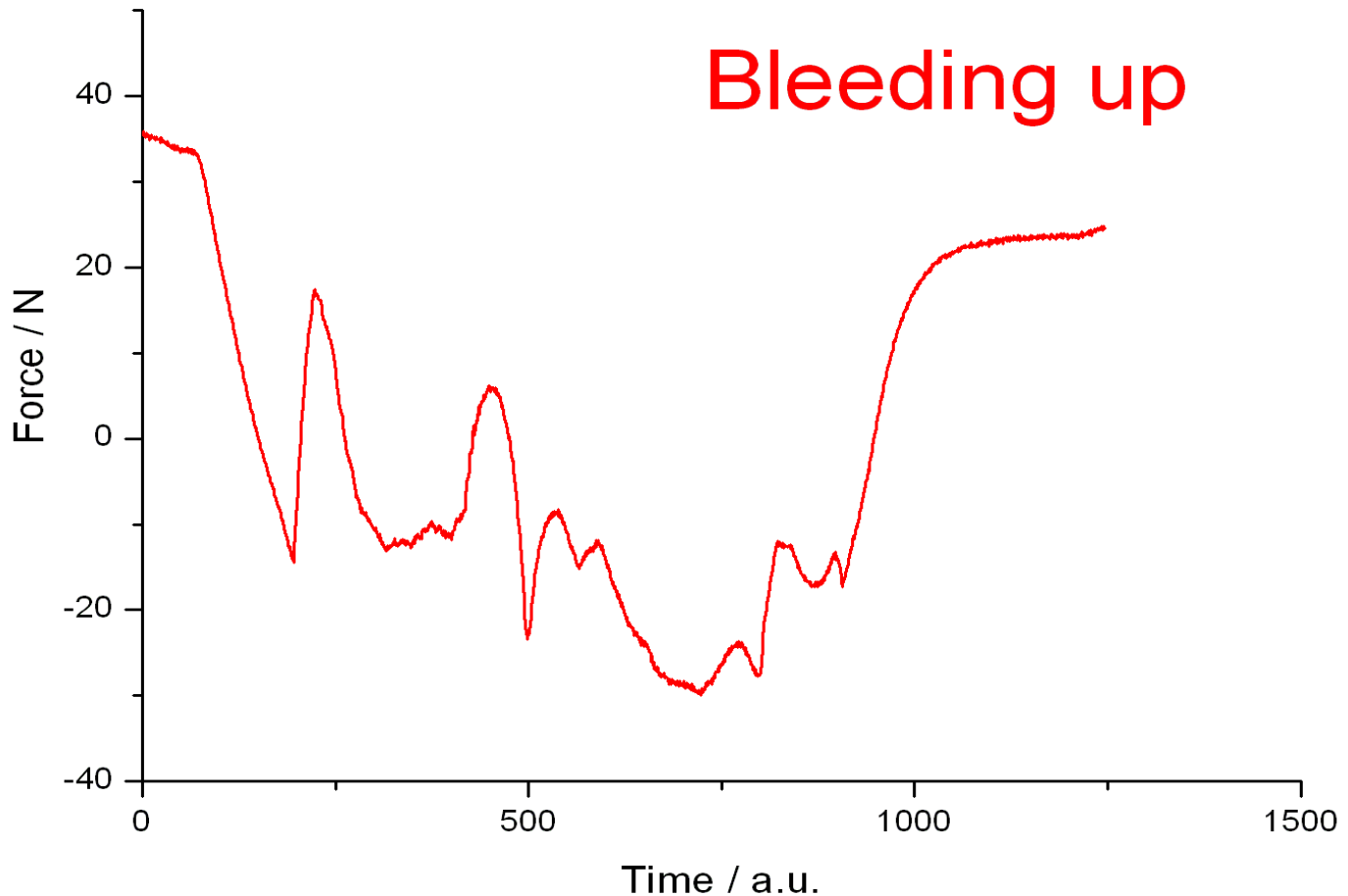


Force
sensor

Forces on Shintake end: 1



Forces on Shintake end: 2



Entire assembly holds vacuum

