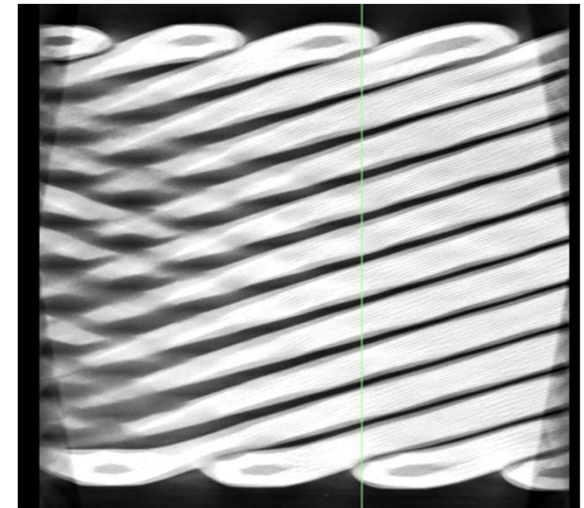
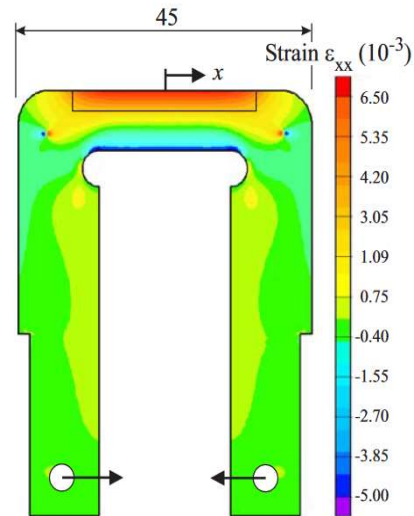
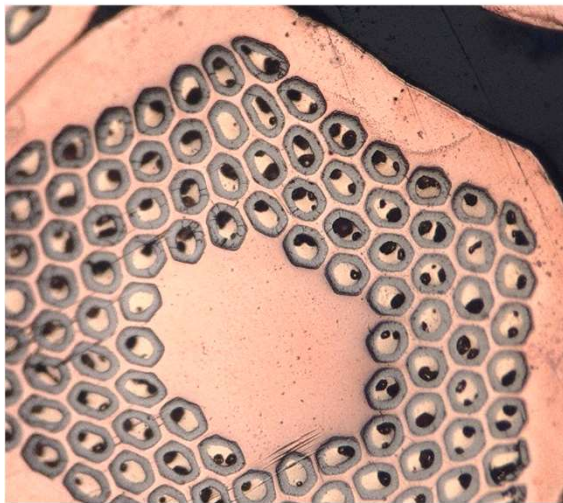


Introduction to Nb_3Sn activities at University of Twente

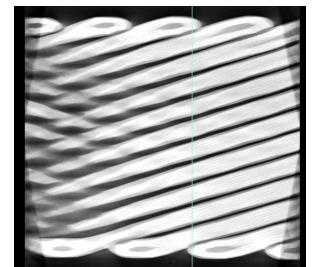
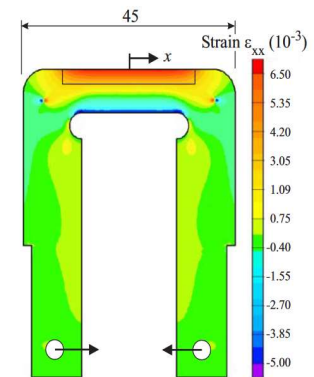
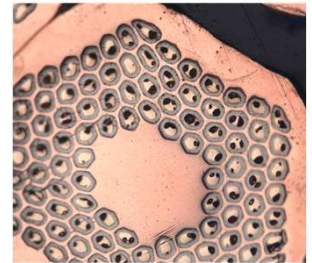


Anna Kario, Arend Nijhuis, Marc Dhalle, Simon Otten, Sander Wessel and Herman ten Kate



Electromechanical behavior of innovative Nb₃Sn wires and cables

- Strain limits of novel Nb₃Sn strand architectures
- Understanding strain limits of Nb₃Sn Rutherford cables based on new strands
- Impregnation influence and interaction with Nb₃Sn cable structure
- Electromagnetic characterization of novel wires and cables

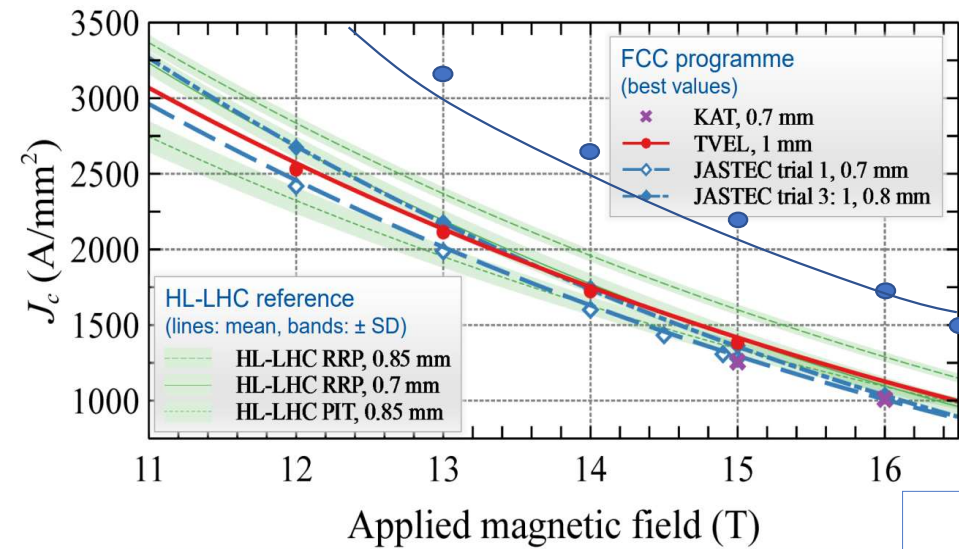




Strain limits of novel Nb₃Sn strand architectures

- J_c summary of different Nb₃Sn wires

Courtesy of Simon C. Hopkins

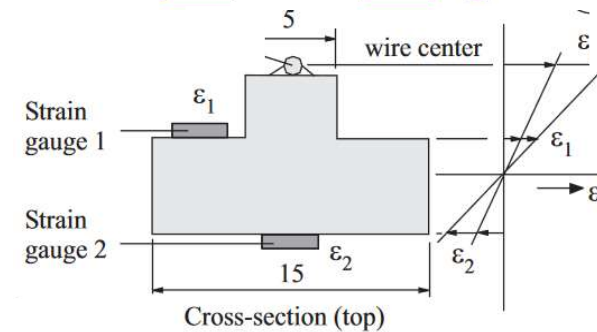
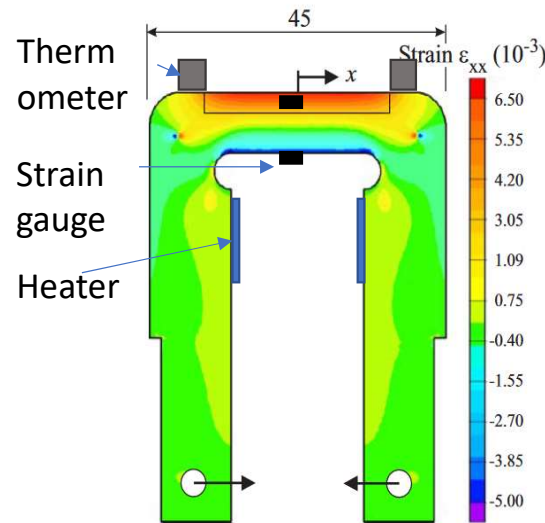


Summary of non-Cu J_c(B) achieved so far, with HL-LHC wires for comparison
 Points: measurements at 4.2–4.3 K Lines: fits scaled to 4.22 K

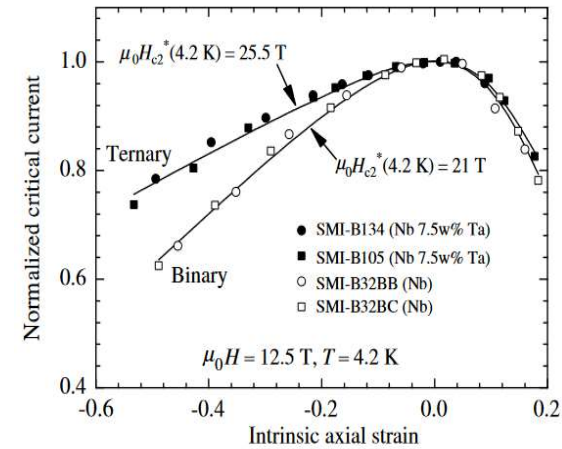
University of Geneva, Courtesy of C. Senatore Internal Oxidation in prototype multi-filamentary wires NbTaHf+SnO₂.

https://indico.cern.ch/event/727555/contributions/3456381/attachments/1869932/3076554/Hopkins_-_Analysis_of_FCC_Nb3Sn_Conductor_at_CERN.pdf

- U-Spring for measurement of critical current versus strain, magnetic field and temperature



A. Godeke et al., Ph.D. dissertation, University of Twente, 2005.

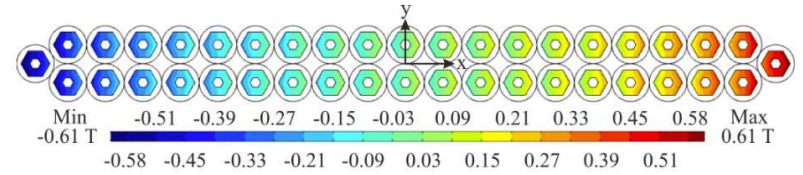
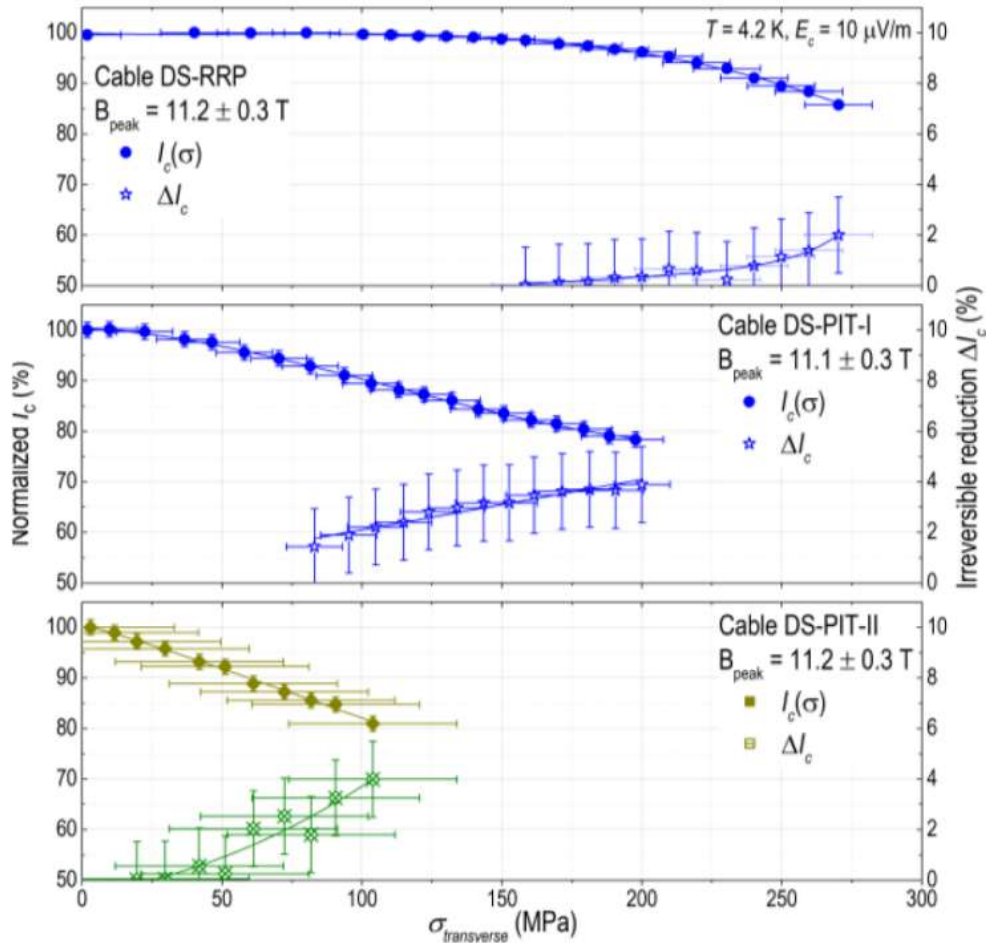


A. Godeke et al., Cryogenics 48 (2008) 308–316

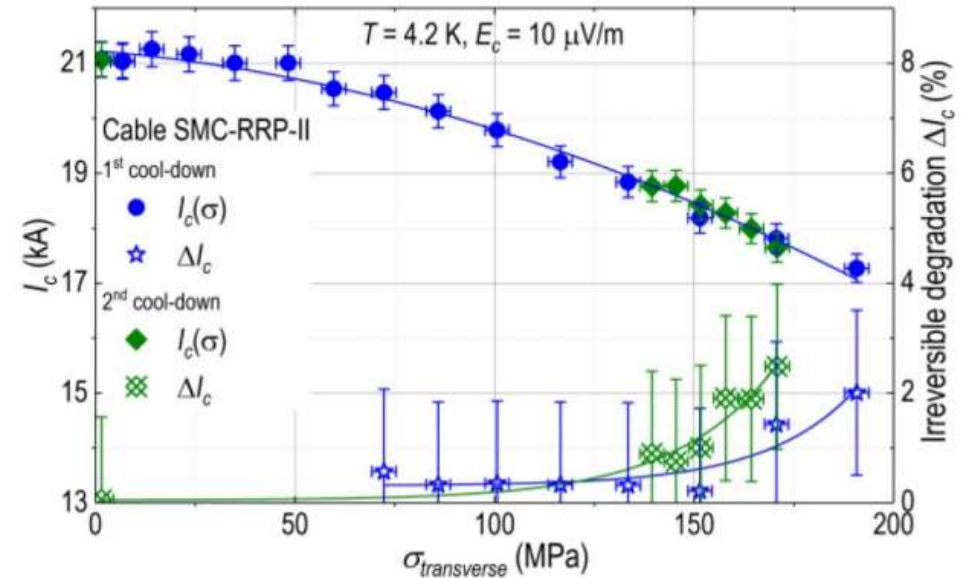
- Strain characterization and understanding of state-of-the-art Nb₃Sn conductors



Understanding strain limits in state-of-the-art Nb₃Sn Rutherford cables

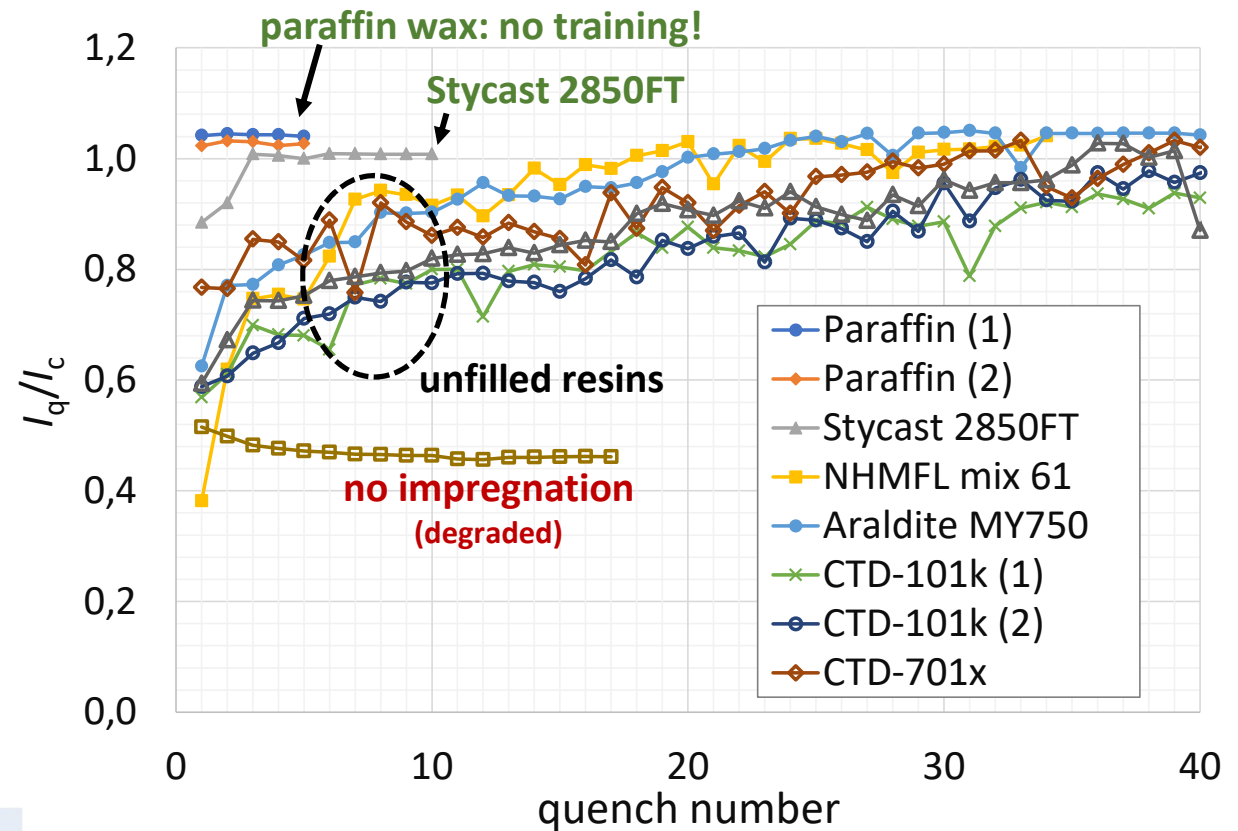
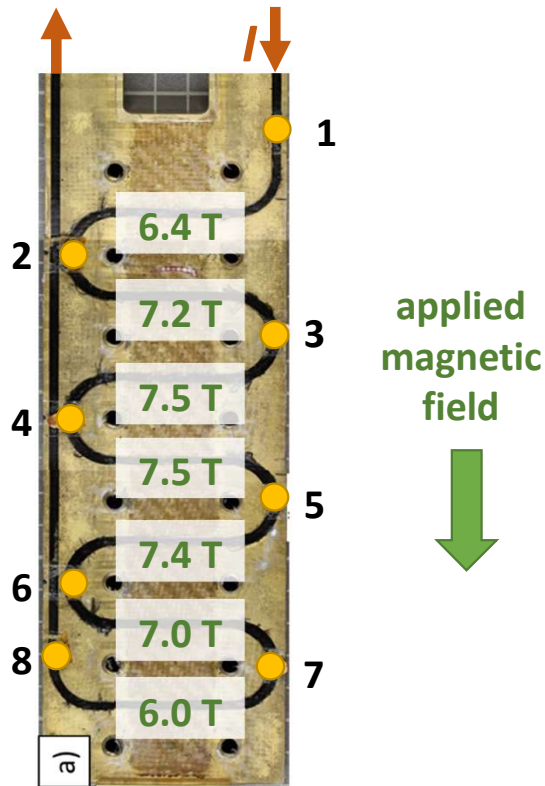


P. Gao, PhD Thesis, 2019.



- Transverse stress characterization and understanding of state-of-the-art Nb₃Sn Rutherford cables

BOX experiments as study example of Nb₃Sn Rutherford cable interaction with impregnation materials

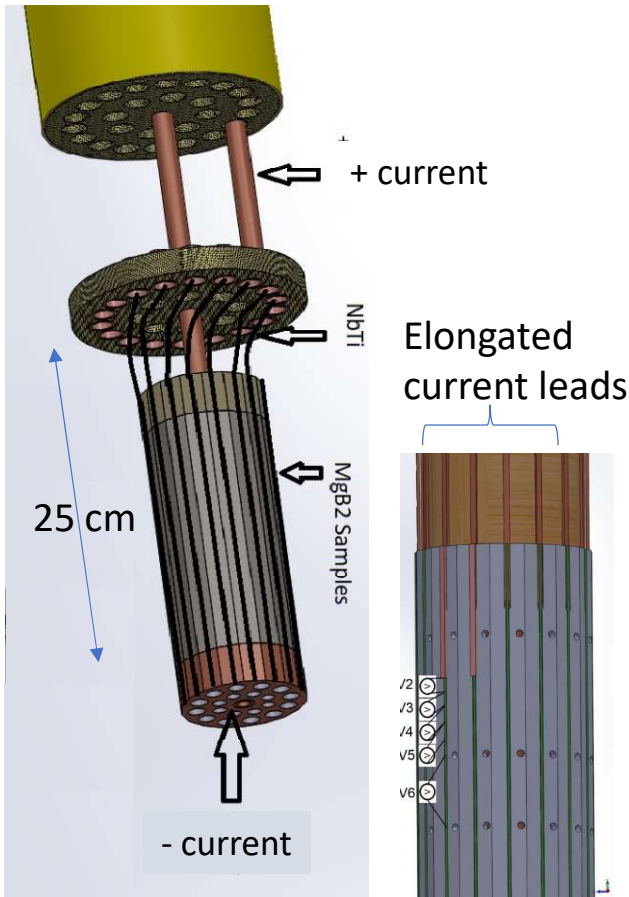


- Controlling **training** in Nb₃Sn Rutherford cables is key to the success of high-field accelerator magnets.

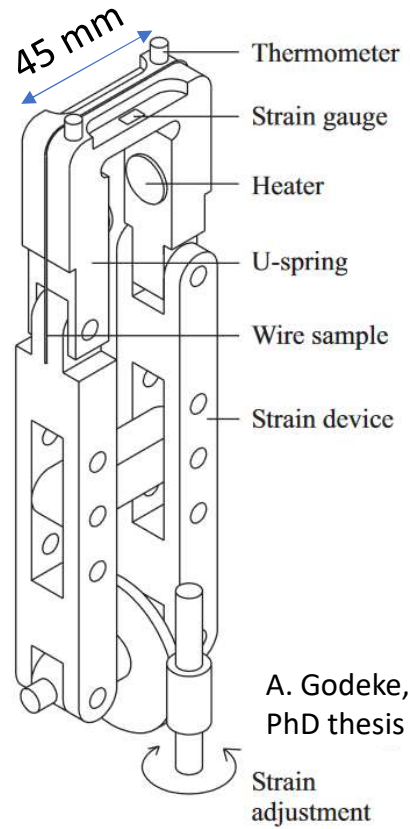


Superconducting wire characterization methods

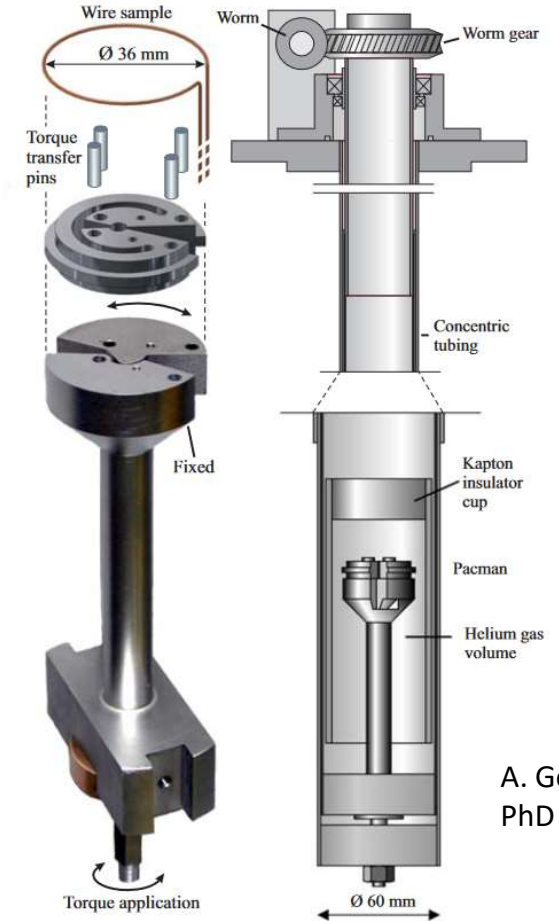
- I_c measurements in parallel magnetic field up to 15 T.



- I_c measurements in perpendicular magnetic field up to 15 T.



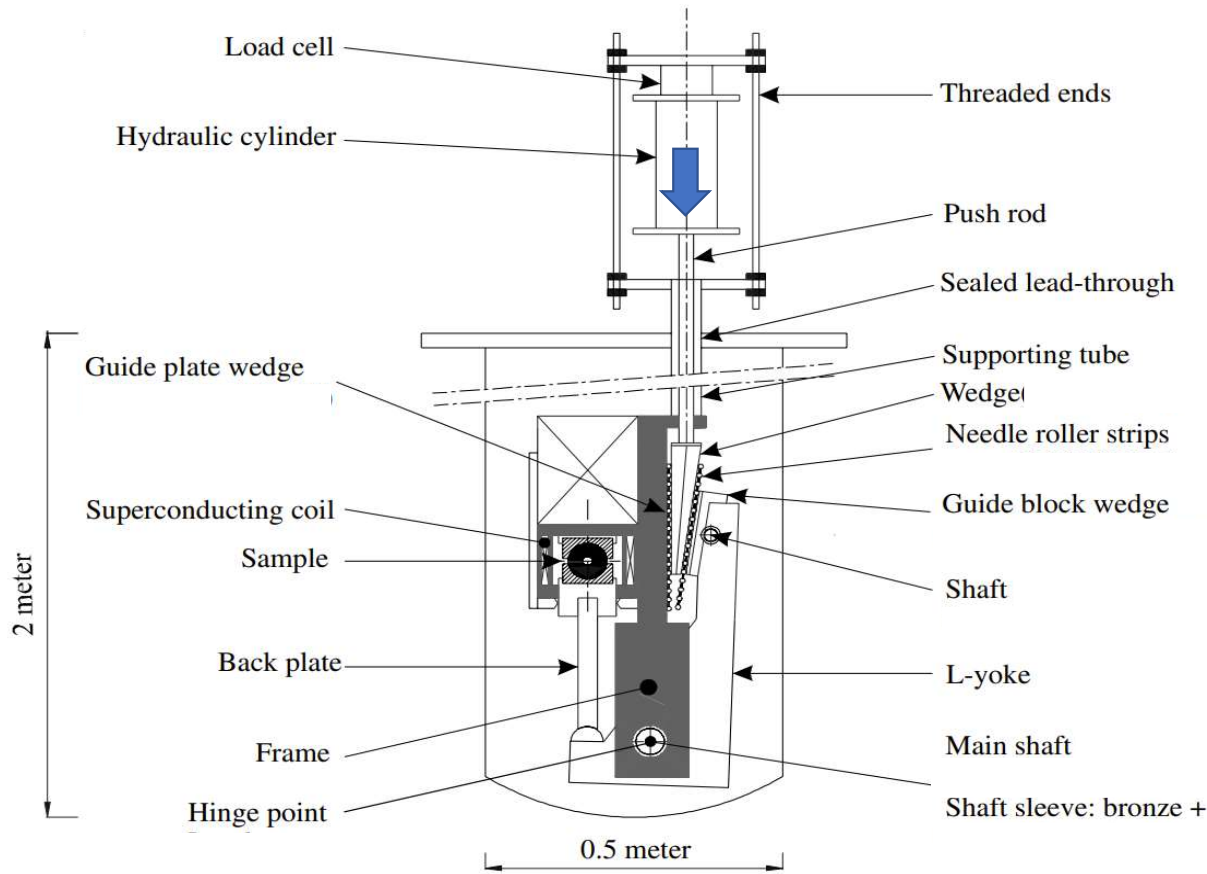
- I_c measurements as function of strain



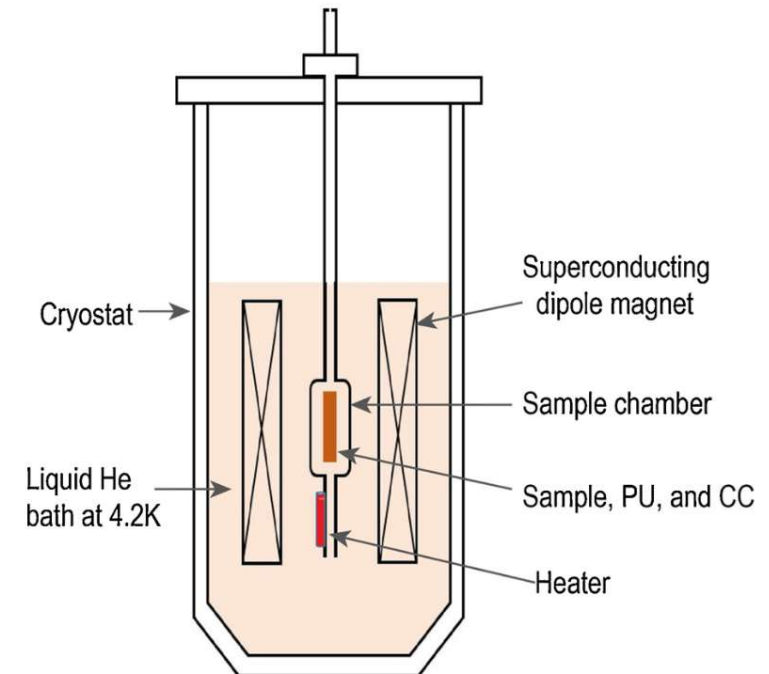


Superconducting wire and cable characterization methods

- AC losses and mechanical properties up to 320 kN



- AC loss in transverse direction; VSM or SC Magnetometer, AC dipole.





Electromechanical behavior of innovative Nb₃Sn wires and cables

- Microstructural analysis
- Training
- Electromagnetic characterization
- Wire and cable mechanical limits
- Design and execution of dedicated experiments

