JOINT UNIVERSITIES ACCELERATOR SCHOOL

CERN

Practical Work @ CERN

Normal Conducting Magnets

Friday 21st February 2014, 9:00 – 17:00

Programm and Organization

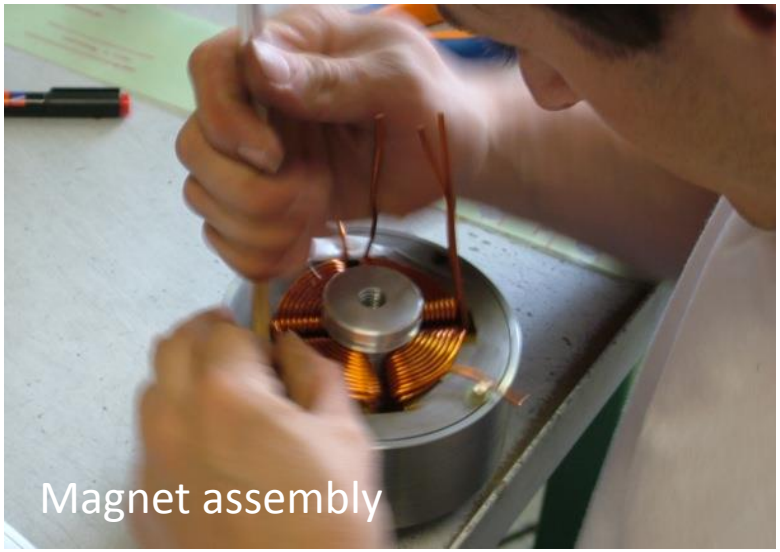
- 8 to 10 participants
- Hands-on practical work in CERN laboratories
- Guided by CERN‘s magnet experts
- Split into two half-day sessions
  - Magnet production and certification
  - Magnetic measurements

Magnet production and certification

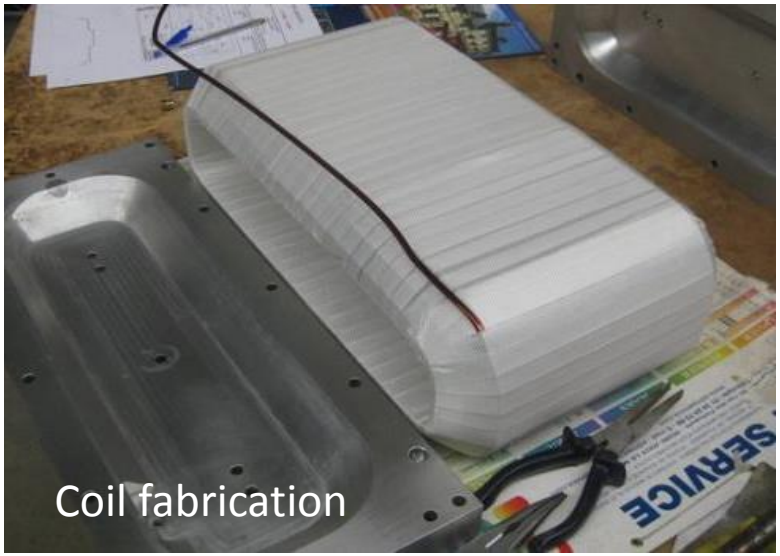
- Introduction to magnet production
  - materials for magnets
  - magnet components
  - manufacturing technologies
  - testing and measurement techniques
- Practical work in magnet test facility NORMATEF
  - participants will perform certification tests and measurements on recently built magnets
- Visit the CERN normal conducting magnet prototype workshop (NORMAPRO) in Prévessin site
  - Yoke manufacturing
  - Coil winding and impregantion

Magnet production and certification


Yoke manufacturing


Magnet assembly


Magnet testing

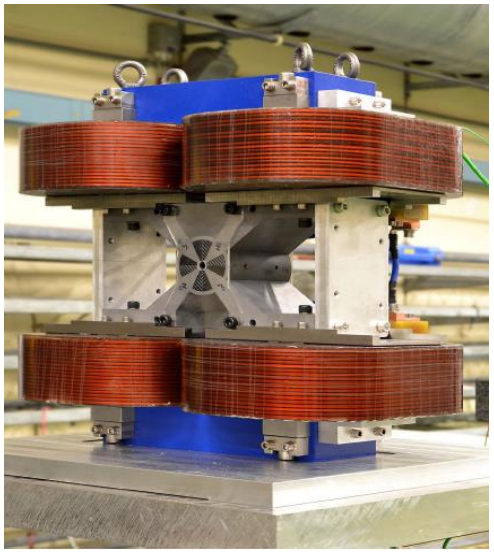


Coil fabrication

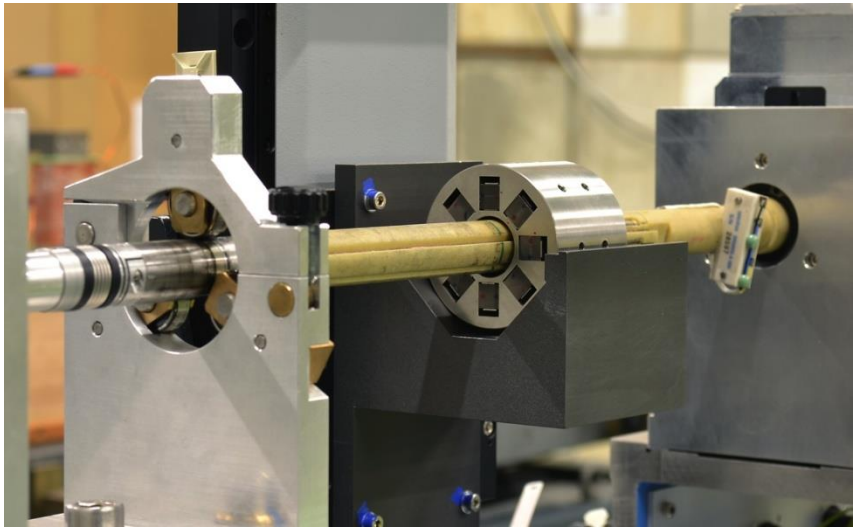
Magnetic measurements

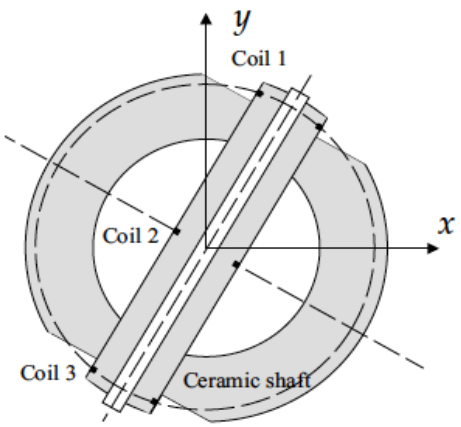
- Visit the Magnetic Measurement Laboratory
- Introduction to different measurement techniques
  - field-map bench
  - rotation coil technique
  - stretched wire technique
- Practical work in magnetic measurement lab I8
  - participants will measure magnets using rotating coil bench
- Analysis of mesurement results with CERN experts

Visit of Magnetic Measurement Laboratory

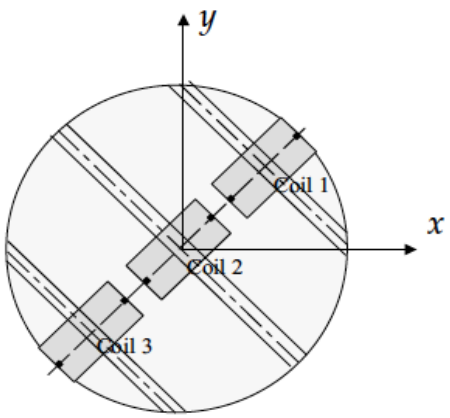


Rotating Coil Measurements

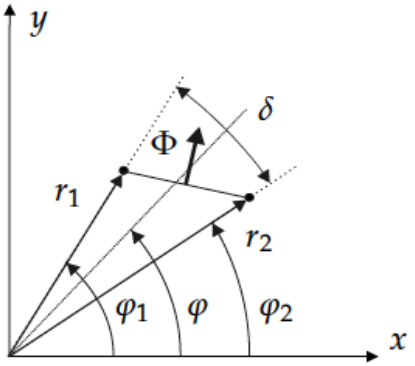




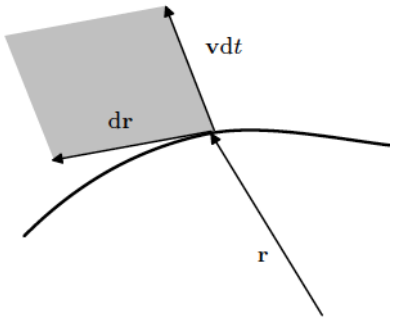
Tangential coil
Radial flux

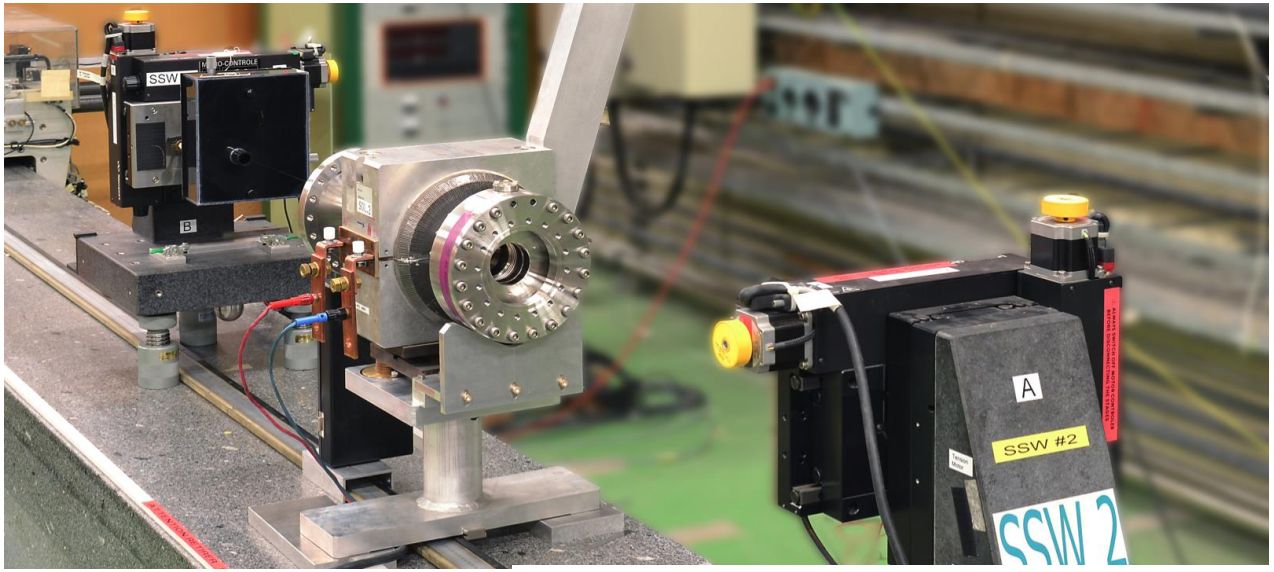


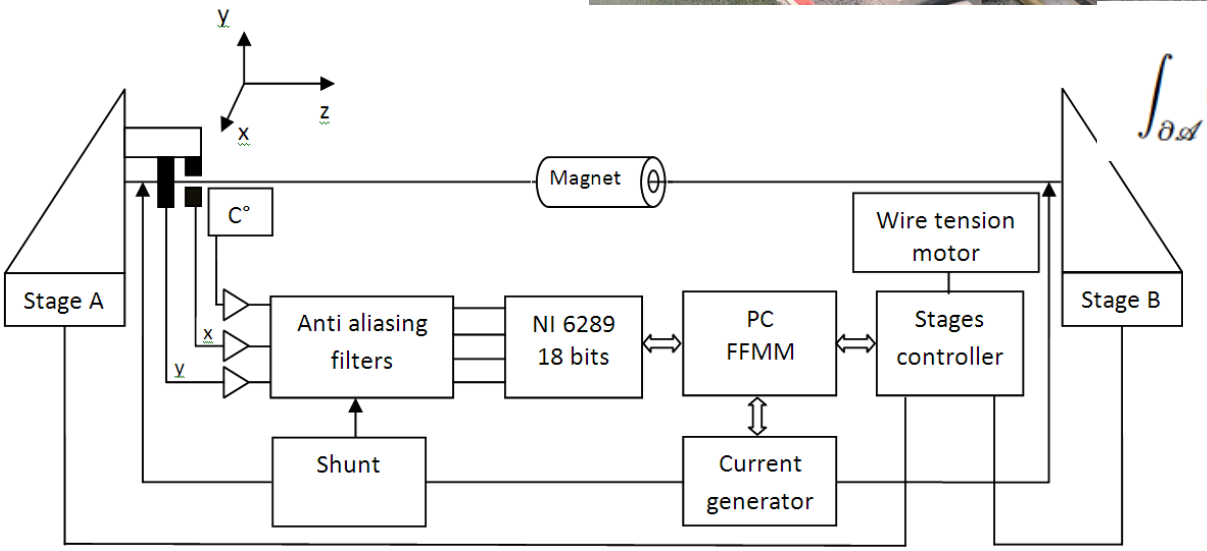
Radial coil
Tangential flux



Streched Wire Measurements







$$\int_{\partial\mathscr{A}} (\mathbf{v}\times\mathbf{B})\cdot\mathrm{d}\mathbf{r} = -\int_{\partial\mathscr{A}} \frac{\mathrm{d}}{\mathrm{d}t}(\mathbf{B}\cdot\mathrm{d}\mathbf{a}) = -\frac{\mathrm{d}\Phi}{\mathrm{d}t}$$

Looking forward...

...to welcome you at CERN!