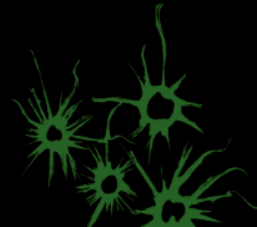


EUCARD-2 WP10 general meeting

Experimental program at **Utwente**,
recapitulation & plans



Peng Gao, Jeroen van Nugteren, Simon Otten,
Bram Hesselink, Bas van Nugteren,
Sander Wessel, Marc Dhallé





Experimental program: research questions

✓ I_c (transverse pressure)

- *Are the selected HTS materials & cable structures & able to withstand accelerator-relevant pressure levels?*

✓ AC loss & magnetization

- *What are the expected loss levels in the cables?*
- *What's the influence of strand magnetization & cable current distribution on the field quality?*
- *Can we use the AC loss data to gauge the inter-strand resistance?*



✓ Stability / NZP

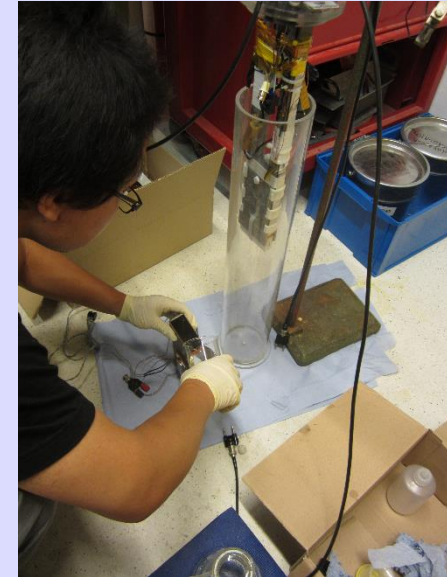
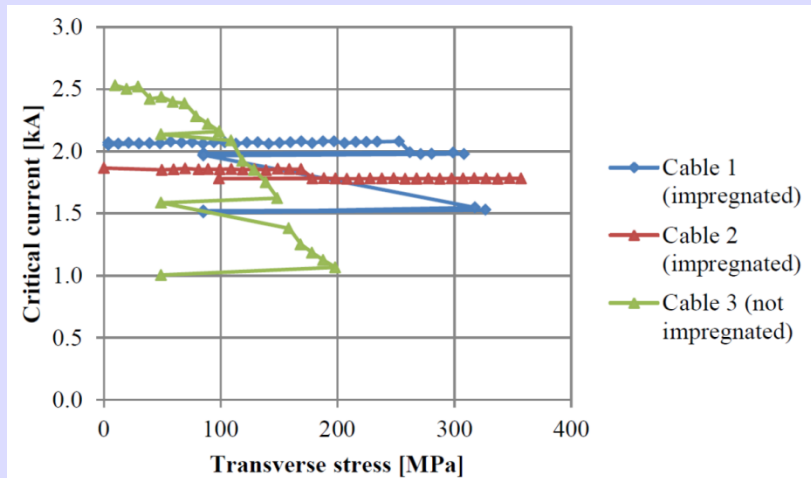
- *How do conductor MQE and vNZP behave with temperature, current and field?*
- *How is this influenced by conductor composition & lay-out?*
- *Can the conductor behavior be extrapolated to cable level?*
- *What's the role of current (re)distribution in cable stability and quench behavior?*

Experimental program: status & plans

✓ I_c (transverse pressure)

→ Running systematic study on **ReBCO Roebel**:

• **10-strands / SP / KIT impregnation** *completed*



• **15-strands / SP / KIT impregn.**

awaiting cabling

• **15-strands / SP / CERN impregn.**

awaiting cabling

• **15-strands / BRUK / CERN impregn.**

cable delivery foreseen mid-December

assist from CERN requested (impregn. mat. + protocol)

→ Planned study on **Bi-2212 Rutherford**:

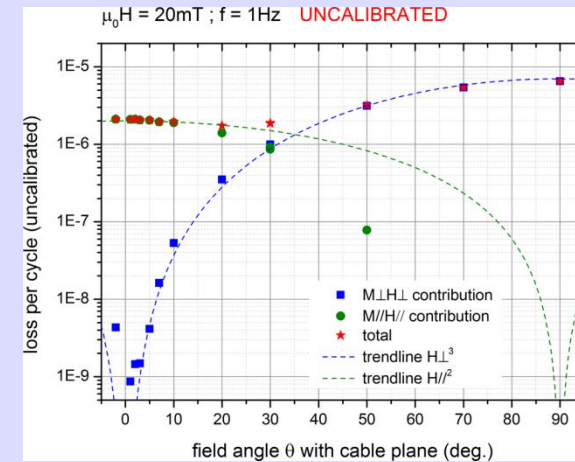
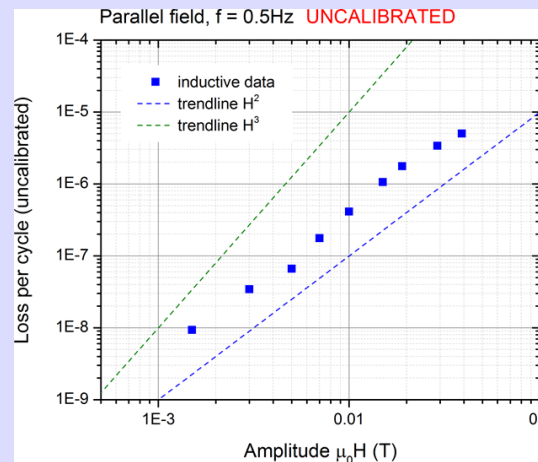
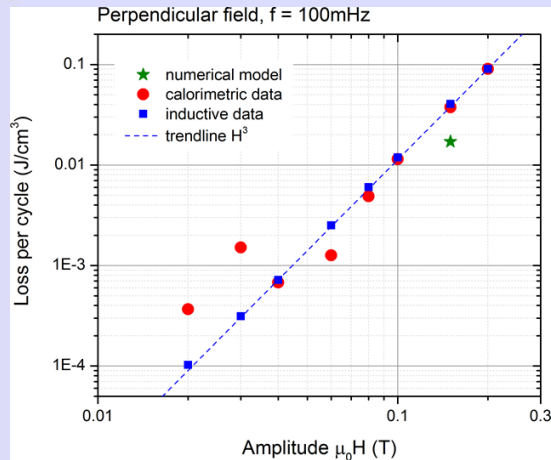
awaiting cables (1bar- & OP HT)

Experimental program: status & plans

✓ AC loss

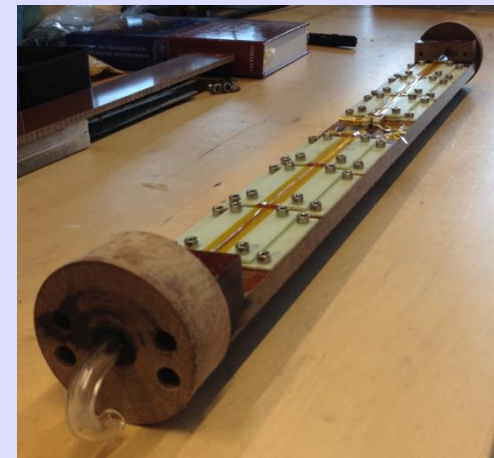
→ 4.2K measurements on 15-strand Roebel CERN

near-completed



Quantitative validation numerical EM model;
Perpendicular field behavior dominated by strand hysteresis;
Signatures of coupling in parallel field.

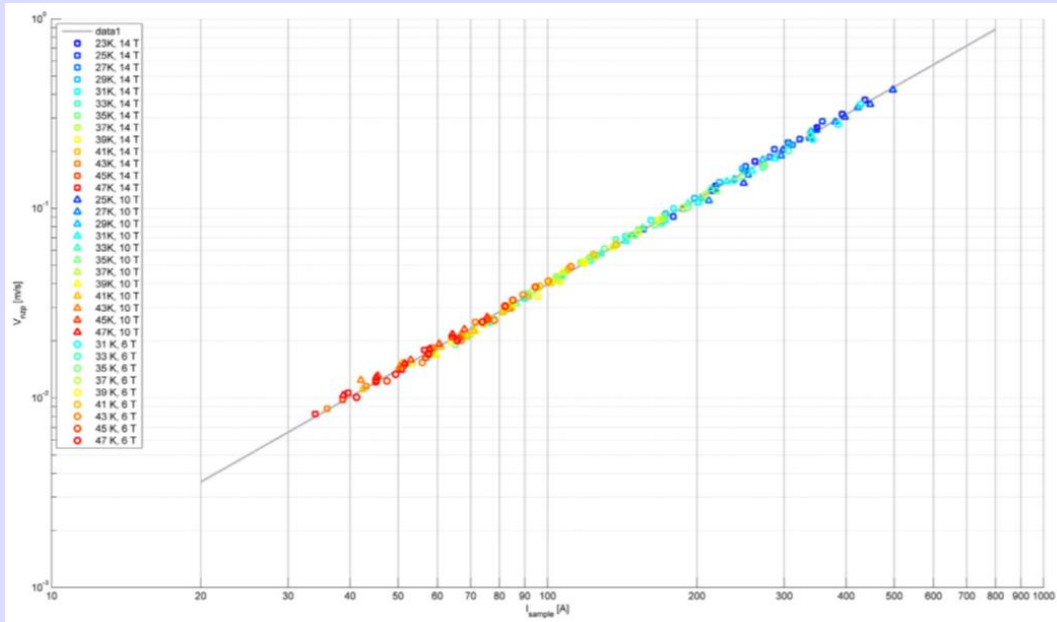
→ *Follow-up measurements? stand-by, open for suggestions (magnetization loops, pressure dependence,...?)*



Experimental program

✓ Stability / NZP

→ MQE & v_{NZP} @ 4.2K – 50K on 4& 2mm SP strands *previous program, completed*



v_{NZP} mainly determined by current level I ;
validation 1D numerical model

→ MQE & v_{NZP} @ 4.2K – 50K on 2mm BRUK strands

awaiting strands (plating)

→ MQE 4.2K on 15-strand BRUK **cable?**

Combination with I_c (pressure)? recycling'