



HFM
High Field Magnets

Introduction to RD line 4 - Modelling Tools, Materials, Protection and Cryogenics

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Main purposes of the RD4 Line

RD4 is focused on the development of enabling technologies that need to be further advanced for HFM magnets:

- **Modelling**: Develop novel modelling techniques and tools for extensive simulation, characterization and in-depth analysis of complex magnet structures
- **Materials**: Develop the next generation of structural, insulation and impregnation materials, including characterization and understanding of the properties in the entire range of their functional application
- **Protection**: Pursue studies of quench management and development of modern quench detection and protection strategies and technologies, including determining the protection limits in function of the density of energy stored in magnets
- **Cryogenics**: Pursue studies of novel cryogenic cooling technologies and thermal management of LTS and HTS magnets, investigation of associated material properties at cryogenic temperatures as well as upgrade of Cryogenic Laboratory facilities for testing and experimental validation of thermal characteristics on novel cryogenic cooling modes.

Organisation of the RD4 Line

The RD4 Line includes the following Work Packages:

- WP4.1 Common modelling and simulation tools for HFM magnets and conductors
- WP4.2 Structural materials for HFM magnets
- WP4.3 Insulation materials for HFM magnet coils and conductors
- WP4.4 R&D on impregnation materials for HFM magnet coils
- WP4.5 Quench detection, protection and diagnostic methods for Nb₃Sn and HTS high-field magnets
- WP4.6 Cryogenic and thermal management studies for HFM magnets



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Organisation of the RD4 fora

Members:

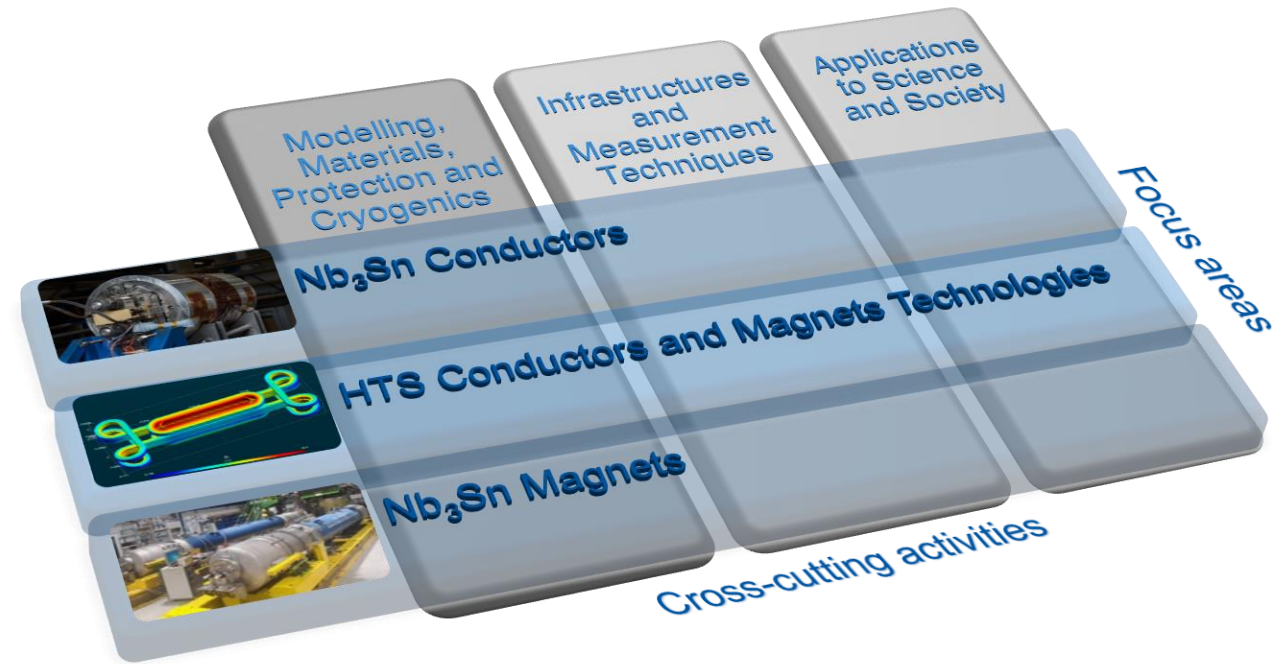
- Work Package Leaders
- Experts for dedicated topics
- Coordinators of Focus Area RD lines (RD 1, 2 & 3)
- Representatives of the different labs.

Contributions from WP holders but also presentations from the different labs for the dedicated transversal topics are encouraged.

Topics discussed in the last months:

- Magnet protection and cryogenics
- Nb₃Sn cable mechanical modelling and structural materials inventory

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