

Upcoming magnet projects @ MLZ

MORIS proposal + EU Infratech Call

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All three magnets share common shielded HTS technology with dry, cryogen-free cooling and common cryostat technology

Common, integrated CCR with shared vacuum vessel for lowest background scattering (3x150k€).

2 identical dilution inserts to be shared among the three magnets (2x350k€).

A 10T asymmetric horizontal magnet optimized for SANS, reflectometry and MIEZE (~1.4 M€)

Dedicated compensated asymmetric horizontal magnet for polarized neutrons.

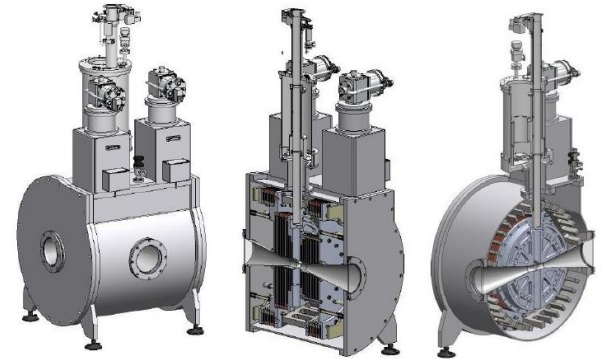
Specifications: 10T horizontal field, 700 kg, ~750 mm x 800 mm size,

$\pm 15^\circ$ opening angles at perpendicular/parallel geometry.

Optimized for forward scattering (SANS, MIEZE-SANS and reflectometry).

Specs. based of two feasibility studies with Bilfinger-Noell and HTS-110.

Gain from 3T to 10T for polarized neutrons and SANS, reflectometry and MIEZE!



A 10T ultra-low background vertical field magnet for time-of-flight (TOF) neutron scattering (~1.5 M€)

Dedicated vertical magnet for the needs of TOPAS and the upgraded TOFTOF.

Wide access at ultra low background with dedicated cryostat and shared vacuum vessel.

Specifications: $-35^\circ \rightarrow 135^\circ$ angular horizontal coverage, $\pm 15^\circ$ vertical coverage. Compact design with <800 mm diameter.

Gain from 2.2T to ~10T for TOF!

Dedicated 6T TAS horizontal magnet for triple axis spectroscopy (TAS) (~1.8 M€)

Dedicated horizontal magnet for the needs of the TAS instruments at MLZ.

Specifications: $2 \times 145^\circ$ horizontal access with limited dark angles at the expense of a medium field strength

No dedicated horizontal TAS magnet available at the moment.

Consortium of ILL, PSI, ESS, FRM II, ISIS, LNCMI, Institut Néel and THEVA

Concept of two joint „travelling“ magnets for the European Neutron community, also serving as propotypes for the future HTS technology.

A 20T static vertical magnet, HTS 1G BSCCO outsert, HTS REBCO 2G insert (not compensated)

Outsert based on commercially available technology, solid and proven design.

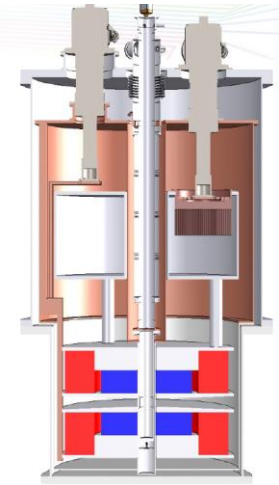
Insert based on recent developments of the high field community, works reliably on the prototypes.

Including bespoke dilution refrigerator

20 T magnet for neutrons

cryogenic design of 12 T magnet

- high- T_c 1G outsert + high- T_c 2G insert
- $\varnothing 10 \times 18 \text{ mm}^3$ sample
- $\pm 2^\circ$ vertical access
- 4 x 45° horizontal access (no rings)
- symmetric HTS coils at 10 K
- 1.5 K fast sample cooling in VTI
- 40 mK dilution insert
- very low liquid He consumption



A 40T pulsed horizontal magnet, based on the evolution of the current ILL/LNCMI design.

Including bespoke dilution refrigerator.



Pulsed magnets

coil energised with 1.1 MJ capacitor

- Available at ILL through collaboration with CEA and LNCMI Toulouse
- M(Q) up to 40 T, 2 to 300 K
- $\pm 15^\circ$ incident horizontal access
- $\pm 30^\circ$ outgoing horizontal access
- $\pm 7^\circ$ outgoing vertical access
- $\varnothing 8 \text{ mm}$ well aligned sample in $\varnothing 16 \text{ mm}$ bore
- one shot every 10' at 40 T, 5' at 31 T

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Thank you for your attention!

MLZ is a cooperation between: