

# Magnet meeting 2024-01-29 notes

## Date

29 Jan 2024

## Attendees

- [Alexander Holmes](#)
- [Joshaniel Cooper](#)
- [Judith Houston](#)
- [Christian Franz](#)
- [Oleksiy Zadorozhko](#)
- [Florence Porcher](#)
- [Mikhail Feygenson](#)
- [Pascale Deen](#)
- [Wai Tung Lee](#)
- [Werner Schweika](#)
- [Felix Villacorta](#)
- [Caroline Curfs](#)
- [Annika Stellhorn](#)
- [Sebastian Jaksch](#)

## Contributors not present

- [Rasmus Toft-Petersen](#) (notes sent re: horizontal magnet)

## Goals

- To identify gaps in magnet provision at ESS and come up with a prioritised list for future magnet investment, based on well defined science cases.

## Discussion items



Magnet meeting Jan 2024.pptx



MagnetSurvey1.pdf

Item	Who	Notes
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- Update on current magnet suite at ESS
- Overview of provision at other facilities
- Discussion

- Existing & upcoming magnets (status updated Apr 2024):



Existing & upco...ng magnets.pptx

Case for a horizontal magnet (RTP):



CaseForHorizon...P\_\_ATH V2.docx

Discussion points	<p>Re: 2.xT Warm bore: HTS_NS_2T (Symmetric) Passively shielded.</p> <p>1st generation HTSC tape will soon no longer be available - but HTS 110 has enough for the next couple of years.</p> <p>For ESTIA will use an asymmetric version that is compatible with PA (Hal has studied this).</p> <p>6.5 T would work for TREX. (Diameter too large for CSPEC collimators)</p> <p>3 - 5 T warm bore? Can provide flexibility.</p> <p>Grant proposal - EU proposal for 20 T HTSC &amp; 40 T Pulsed field.</p> <p>MA11 PSI - split pair horizontal field for SANS - was on original longlist but had dropped off.</p> <p>Address gaps in scientific coverage first.</p> <p>Consider duplication.</p> <p>Medium field workhorse magnets are very useful (e.g. MA10 @PSI).</p> <p>Focus on an instrument and/or a class of instruments.</p> <p>Only magnet of interest is 8 T magnet for MAGIC.</p> <p>Update list</p> <p>Missing: MIRACLES but they are not focussing on magnetism (nevertheless provide smth). Split pair magnet for SANS (STAP: greater than 10 T for SKADI - field perpendicular to the beam; 17 T magnet available for field along beam).</p> <p>17 T Lund University magnet does not have any significant problems with availability. Need for field homogeneity (<math>10^{-4}</math> over sample area) for flux line lattices.</p> <p><b>Tranche 1:</b></p> <p>Loki (1 T magnet) - electromagnet is needed.</p> <p>DREAM 6.5 T and 8 T will be ready for</p> <p>ODIN - not interested - imaging of magnetic domains requires special bespoke electromagnet e.g. @ANTARES.</p> <p>Bifrost : 15 T ready, can also use 6.5 T.</p> <p><b>Tranche 2:</b></p> <p>ESTIA: Warm bore 2.1 T (70 % of usage): <b>NEED GMW magnet - electromagnet - 10 cm of space - pole pieces get you to 3 T. ISIS have three of these - go up to 0.8 T in the largest opening. Field changes are very easy. 90 KEuro - decent water chiller - power supply up to 100 A. 5 T Warm bore for NR, SANS is useful.</b></p> <p>NMX : doesn't care</p> <p>SKADI: Warm bore 2.1 T - need high field (more than 10 T) - issues with PA. 17 T magnet.</p> <p>FREIA - does not care</p> <p><b>Tranche 3:</b></p> <p>HEIMDAL: 8 T diffraction - PA possible.</p> <p>TREX: 14 T We need a 10 T generic. 6.5 T but we do not know the background.</p> <p>CSPEC: 14 T We need a 10 T generic.</p> <p>Can we share the magnets between TREX and CSPEC only.</p> <p>MIRACLES; Low field</p> <p>VESPA; Doesn't care.</p> <p>BEER : Doesn't care</p> <p>MAGIC: 8 T magnet 6.5 T magnet</p>
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Prioritised list		<div>  <p>Magnet list jan 29 2024.pptx</p> </div> <p>Notes: 10T magnets similar priority, set by instrument sequencing.</p>
Instrument estimate usage		<a href="#">Magnet usage estimates.xlsx</a> To be completed by instruments, with STAP assistance.

## Action items

- ☐ Ask the STAP for importance of duplication and review proposal.
- ☐ Ask instrument scientists for usage time - both of current magnets and future magnets. Consider 2MW operational.
- ☐ DREAM - clarify user case for SANS magnet.