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Wed-Mo-Po.11-01: Magnet-technology developments at the HLD pulsed-field facility

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The Dresden High Magnetic Field Laboratory (HLD) is a pulsed-field user facility, which provides external and in-house researchers with the possibility to perform a broad range of experiments in pulsed magnetic fields [1]. Being a member of the European Magnetic Field Laboratory (EMFL), HLD offers access and supports more than 100 scientific projects annually. At the HLD, a diverse set of high-resolution experimental techniques allows to measure, for example, electrical transport, magnetization, ultrasound, magnetostriction, magnetic resonance (ESR and NMR), permittivity, magnetocaloric effect, and high-field infrared spectroscopy in non-destructive pulsed magnetic fields. The Dresden High Magnetic Field Laboratory operates ten experimental cells equipped with a variety of pulsed magnets energized by two independent, modular capacitor banks with maximum stored energies of 50 and 14 MJ at 24 kV maximum operational voltage.

In addition to the pulsed-magnet designs for the needs of the HLD, we further develop pulsed magnets for other large-scale facilities, such as the European XFEL and the ESRF, with the goal of providing magnetic fields up to the 60 T range. Here, we discuss different approaches, advances, and challenges in the pulsed-magnet design for x-ray scattering experiments at large-scale facilities.

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