

Western Pennsylvania Quantum Information Core Quantum Design MPMS 3 System

The Quantum Design MPMS 3 is a cryogen-free magnetic property measurement system designed for high-sensitivity characterization of magnetic materials. Utilizing SQUID (Superconducting Quantum Interference Device) technology, it delivers high sensitivity for detecting extremely small magnetic signals. The system supports multiple measurement modes and offers fully automated control of temperature and magnetic field.

Temperature

- Range: 1.8 K to 400 K with rapid temperature control
 - Cooling rate: 300 K to 1.8 K in approximately 25 mins
 - Stability: $\pm 0.5\%$
 - Accuracy: $\leq \pm 1\%$ or 0.5 K
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Magnetic Field

- Range: - 7 kOe to +7 kOe
 - Superconducting switch: QuickSwitch
 - Ramping rate: 4 to 700 Oe/s
 - Ramping resolution: 0.33 Oe
 - Field uniformity: 0.01% over 4 cm axially
 - Compensation coil for ULF option
 - Modulation coil for AC option
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DC Scan Mode

- Sensitivity: $< 5 \times 10^{-8}$ emu ($H \leq 2,500$ Oe)
- $< 6 \times 10^{-7}$ emu ($H > 2,500$ Oe)

- Maximum moment: 2 emu
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SQUID-VSM Mode

- Sensitivity: $< 1 \times 10^{-8}$ emu ($H \leq 2,500$ Oe)
- $< 8 \times 10^{-8}$ emu ($H > 2,500$ Oe)
- Maximum moment: > 100 emu