

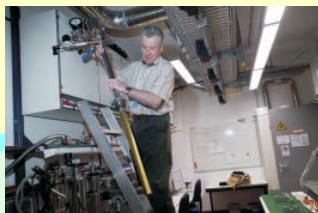


The Laboratory for Magnetic Measurements at BENSNC

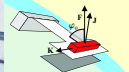
Klaus Kiefer, Bastian Klemke, Michael Meißner

With the special emphasis on experiments at high magnetic fields and low temperatures, BENSNC is offering extreme physical conditions for structural research. Beam-line based investigations, however, have to be accompanied in most cases by complementary measurements. Since recent years, the departments for structural research at HMI operate a variety of research laboratories for sample characterisation. In order to install a service for BENSNC users providing access to complementary measurements at extreme conditions, these laboratories have been combined to form the new Laboratory for Magnetic Measurements at BENSNC (LaMMB). At present, the possibilities of LaMMB offer four different measurement systems with magnetic fields up to 14.5 T and temperatures down to 260 mK. The available measurement options are heat capacity, heat conduction, magneto-caloric effect, magnetization and resistivity. A new state-of-the-art cryogenic system with magnetic field up to 17 T and temperatures down to 8 mK is under construction. In 2007, more than 100 experiments served the research projects of 26 internal users and 6 external user groups.

8T ³He-System
Heat Capacity
Temp.: 300 mK
Field: 8T



14.5T ³He-System
Heat Capacity
Magcal. Effect
Magnetization
Temp.: 260 mK
Field: 14.5T



17T Dilution System
Heat Capacity
Magnetization
Temp.: 8 mK
Field: 17T
Start: 2008



LaMMB

5T MPMS SQUID
Temp.: 1.8 K
Field: 5 T



14T PPMS
Heat Capacity
Magnetization
Dielectric Meas.
Temp.: 1.8 K
Field: 14 T



Date	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Day	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	
Res.																																	
CM-8T																																	
CM-14.5T																																	
PPMS-14T																																	
MPMS-5T																																	
CM-17T																																	
Open																																	

Experimental Setup	Cryostat / Magnet	Magnetic Field	Temperature	Measurement Options	typ. Resolution	max. Resolution	Responsible
CM-8T	Oxford Instruments	8 T	0.35 K .. 200 K	heat capacity (Cp)	1%-2%	1e-9 J/K	M. Meißner
CM-14.5T	Oxford Instruments	14.5 T	0.26K .. 300 K	heat capacity (Cp) magnetocaloric effect dielectric constant (Dk) electric resistivity magnetisation (Cantilever)	0.1% - 2% 0.1% 0.0001% 0.001% 0.1% - 2%	1e-9 J/K 3e-8 J/T 10 aF 1e-4 Ohm 2e-10 Am²	K. Kiefer
PPMS-14T	Quantum Design	14 T	1.8 K .. 400 K (1000 K)	magnetisation (VSM) torque magnetometer electric resistivity thermal transport	0.5% - 0.01% 5%	1e-9 Am² 1e-9 Nm - 2e-6 W/K	K. Kiefer
MPMS-5T	Quantum Design	5 T	2K .. 400 K	magnetisation (SQUID)	-	-	K. Siemensmeyer

Luttinger Spin-Liquid in the Metal-Organic Spin Ladder Material (C₅H₁₂N)₂CuBr₄

Ch. Rüegg¹, K. Kiefer², B. Thielemann³, D. F. McMorrow¹, V. Zapf⁴, B. Normand⁵, M. Zvonarev⁶,
C. Kollath⁶, P. Bouillot⁶, T. Giamarchi⁶, S. Capponi⁷, D. Poilblanc⁷, D. Biner⁸, and K. W. Krämer⁸

¹Department of Physics and Astronomy, University College London, UK — ²LaMMB, BENSNC Hahn-Meitner-Institut Berlin, Germany —

³ETH Zurich and PSI, Switzerland — ⁴NHML, Los Alamos, USA — ⁵EPFL, Lausanne, Switzerland —

⁶DPMC, Université de Geneve, Switzerland — ⁷Université de Toulouse, France — ⁸Universität Bern

