

IMAGING JRA

Status Report 01.08.2013-31.01.2014

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Objectives

Working within the research activity new techniques and modelling tools will be made available for a large number of users from the large communities of the nanomagnetism, engineering and generally from materials science.

Periodic report (Aug.2013 – Feb.2014)

Task

Status

18.1. Nano- and micro structures resolved dark-field imaging with grating interferometers.

Ongoing

18.2. Direct high-resolution neutron imaging.

Ongoing

18.3. Energy-selective neutron imaging.

Ongoing

18.4. SANS 3D: vectorial magnetic imaging of nano-particles with a resolution of 1nm to 100 nm.

Ongoing

18.5. Precession techniques for imaging magnetic structures in thin film systems.

Ongoing

18.6. Tomographic imaging of magnetic structures at the μm scale.

Ongoing

DELIVERABLES

Del. no.	Deliverable name	Lead beneficiary	Nature	Delivery date from Annex I (proj month)	Actual / Forecast delivery date	Delivered Yes/ No/ Ongoing
18.1	Implementation of grating interferometry for visualization of residual stresses	6	O	36	36	Ongoing
18.2	Publication and interim report	6	R	36	36	Ongoing
18.3	Grating interferometry experiments performed with university partners	3	O	48	48	Ongoing
18.4	Optimization of high-resolution detector system	6	O	18	18	Yes/Ongoing
18.5	Adapting of high-resolution detector system	5	O	36	42*	Ongoing
18.6	High-resolution experiments performed with university partners	3	O	48	48	Yes/Ongoing
18.7	Optimization of monochromator parameters for high wavelength resolution	6	O	18	18	Yes
18.8	Bragg-edge mapping and energy-selective experiments	5	R	36	42*	Ongoing
18.9	Extending the technique towards ToF-imaging	5	O	48	48	Ongoing
18.10	Evaluation of the PASANS	7	R	18	18	Yes/Ongoing
18.11	User friendly sample environment	4	R	36	36	Ongoing
18.12	User friendly platform for PASANS	2	O	48	48	Ongoing
18.13	Evaluation of the Precessionnal spectroscopy techniques possibilities	7	R	18	18	Yes/Ongoing
18.14	Precession spectroscopy measurements	7	R	36	36	Ongoing
18.15	User friendly platform for the exploitation of precession data	2	O	48	48	Ongoing
18.16	Imaging of magnetic structures in bulk samples with high resolution	6	R	18	18	Yes/Ongoing
18.17	Direct magnetic imaging experiments	5	R	36	42*	Ongoing
18.18	Data processing platform	3	R	48	48	Ongoing
18.19	Wiki pages on NMI3 portal	7	R	48	48	Ongoing

* Due to extended shutdowns of the neutron sources BER2 (Berlin) and FRM2 (Munich) some delays in deliverables D18.5, D18.8, D18.17 are possible.

	Beneficiary	A	B	C
A) Total Person Months (PM) allocated to project (including facility contribution) per contributing partner (Annex 1, Part A, p.96)	MTA EK	11	5	1.25
	CEA P7	16	8	2
	NPI	4	1	1
	TUD	10		0.5
B) Total staff effort charged to project per contributing partner (Annex 1, Part B p.32)	TUM	35	18	
	HZB	38	28.5	14.25
	PSI	34	18	
C) Staff effort charged to project in period (Month 19-25)	FZJ	28		
	STFC	2		

Conferences:

1. NINMACH 2013 1st International Conference on Neutron Imaging and Neutron Methods in Archaeology and Cultural Heritage Research, Sept. 9-12, 2013, Garching
2. International Workshop on Neutron Optics and Detectors (NOP&D 2013) (conference partially supported by NMI3)
3. Advances in Polarized Neutron Reflectivity Bochum July 2013
4. Business Meeting of the Neutron Imaging JRA (11 July Edinburg)

Papers:

1. P. Mikula, M. Vrána, J. Šaroun, V. Em, B.S. Seong, Investigation of multiple Bragg reflections at a constant neutron wavelength and their possible separation, July, Journal of Physics: Conference Series 340 (2012) 012015 doi:10.1088/1742-6596/340/1/012015
2. P. Mikula, M. Vrána, J. Šaroun, V. Davydov, V. Em and B.S. Seong, Experimental studies of dispersive double reflections excited in cylindrically bent perfect-crystal slabs at a constant neutron wavelength, J. Appl. Cryst. 45, (2012) 98-105.
3. P. Mikula, M. Furusaka, K. Ohkubo and J. Saroun, TOF studies of multiple Bragg reflections in cylindrically bent perfect crystals, J. Appl. Cryst. 45 (2012) 1248-1253.
4. P. Mikula, M. Vrána, J. Šaroun, B.S. Seong, C. Woo and V. Em, Neutron diffraction studies of dispersive double-crystal setting containing a fully asymmetric diffraction (FAD) geometry of a bent perfect crystal (BPC) with the output beam expansion (OBE), In Proc. of the International Workshop on Neutron Optics and Detectors (NOP&D 2013), 2-5 July 2013, Munich (Ismaning), Germany; IOP: Conference series, accepted for publication.
5. P. Mikula, M. Vrána, J. Šaroun, J. Pilch, B.S. Seong, W. Woo and V. Em, Neutron diffraction studies of double crystal (+n,-m) setting containing a fully asymmetric diffraction geometry (FAD) of a bent perfect crystal (BPC) with the output beam expansion (OBE), J. Appl. Cryst. 47 (2014) Part 2, 599-605.
6. P. Mikula, M. Vrána, Observation of Edge Refraction on a Conventional Neutron Diffractometer Employing Dispersive Double-Crystal Monochromator, In Proc. of the Int. Conf. WCNR-10, Grindelwald, Switzerland, 5-10 October 2014; Physical Procedia, 2015, submitted.
7. P. Mikula and M. Furusaka, TOF studies of multiple Bragg reflections in cylindrically bent perfect crystals at small pulsed neutron source, In proc. of Int Conf. ICANS XXI, 29th Sept. - 3rd Oct. 2014, Ibaraki, Japan, submitted.



NPI



The JRA Imaging combines neutron experimental techniques in the direct and the reciprocal space in order to resolve structural and magnetic features on different length scales.

