

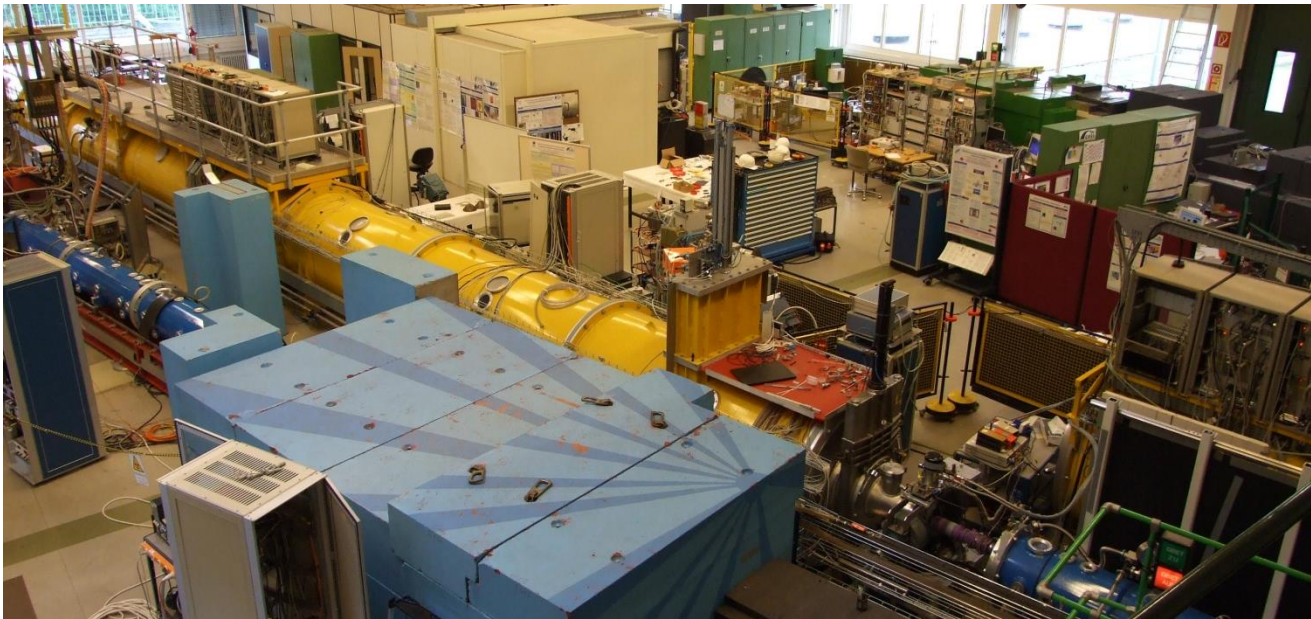
Petersburg Nuclear Physics Institute
National Research Center
«Kurchatov Institute»



Helmholtz-Zentrum
Geesthacht

Zentrum für Material- und Küstenforschung

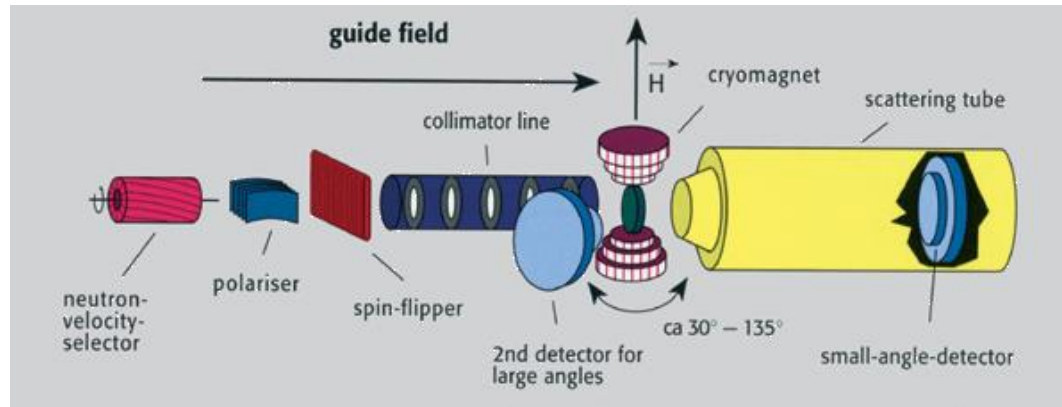
Reconstruction of SANS-2



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Functioning cold non-polarised and polarised neutrons SANS-2 is mainly dedicated to neutron small-angle scattering studies of precipitates, clusters, interfaces, grain sizes, magnetic structures, etc. in such materials as - metals, ceramics, polymers and colloids.

At GKSS its special feature was that all the components which defined the sample environment were movable on air cushions. The sample environment area was variable from a few mm up to 2.5 m length. Thus SANS-2 was the most variable instrument for small angle scattering at GeNF.



SANS-2 Instrument Details:

Beamline:	Cold neutron guide NG-2, radius of curvature $R = 900$ m, cross section 3×4 cm ²		
Monochromator:	helical slot velocity selector (Dornier)		
Wavelength range at sample position:	0.3 to 2.0 nm		
Wavelength resolution:	$\Delta\lambda/\lambda = 0.1$ (2 additional velocity selectors with $\Delta\lambda/\lambda = 0.05$ and 0.2 are available)		
Length of collimation:	max. 16 m (2 m elements)		
Flux at sample position:	$\Phi_{\max} = 2 \cdot 10^7$ cm ⁻² s ⁻¹ (1 m collimation, $\lambda = 0.5$ nm)		
Range of momentum transfer:	$0.01 \leq q \leq 3$ nm ⁻¹ (small-angle scattering) $q \leq 25$ nm ⁻¹ (wide-angle scattering with 2. detector)		
Distance sample to detector:	$1.0 \text{ m} \leq d \leq 22 \text{ m}$, optional 2. detector for wide angles: $d = 1 \text{ m}$		
Detector:	2-dim. position-sensitive ³ He-counter	active area:	55 x 55 cm ²
		resolution:	0.7 x 0.7 cm ²
		background:	4 cps



Dismounting of SANS-2 at GKSS

SANS2



Transfer of SANS-2

SANS2



Kind of works	2014	2015	2016	2017	2018
Simulation of SANS-2					
Transportation of equipment on PIK					
Collimation tube					
Detector tube					
Detector					
Velocity selector					
Electronics					
Operating program					
Sample area equipment					
Fit-up of SANS-2					
Making of supports for SANS-2 (+0.5m)					
Final installation of SANS-2					
Shielding					
Final test of SANS-2					

The reconstruction plan for 2015

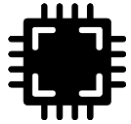
Kind of works (2015)	1	2	3	4	5	6	7	8	9	10	11	12
Simulation of SANS-2												
Transportation of equipment on PIK												
Collimation tube												
Detector tube												
Velocity selector												
Electronics												
Control program												
Vacuum pumps												
Sample area equipment												
Fit-up of SANS-2												



Responsible – A. Chumakov



Co-Responsible – I. Shishkin



Electronic men – A. Sumbatyan, A. Sizov,
M. Kraskovskiy, D. Ipatov



Vacuum man – S. Shustov



Mechanic man – V. Lebedev

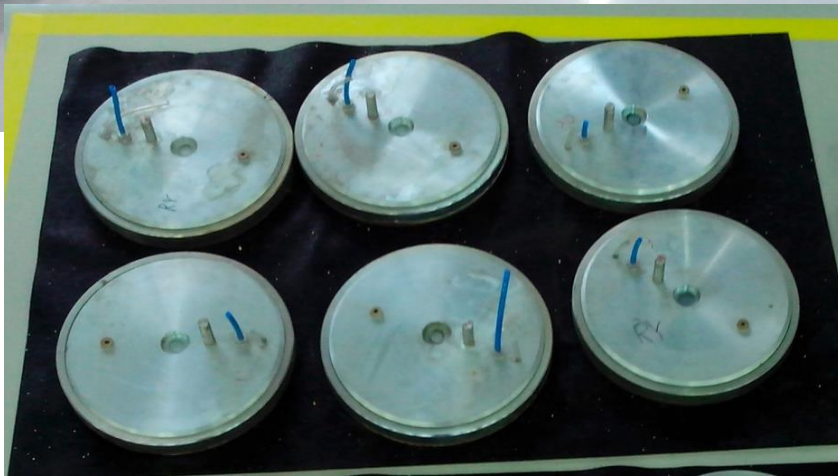


Crane driver – S. Movchan



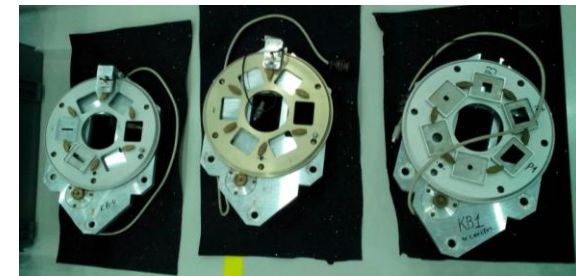
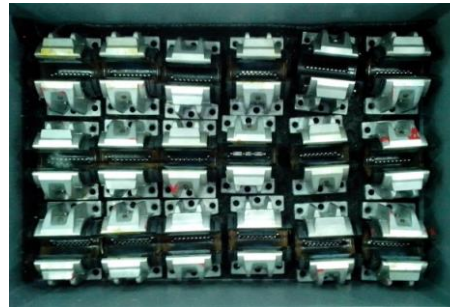
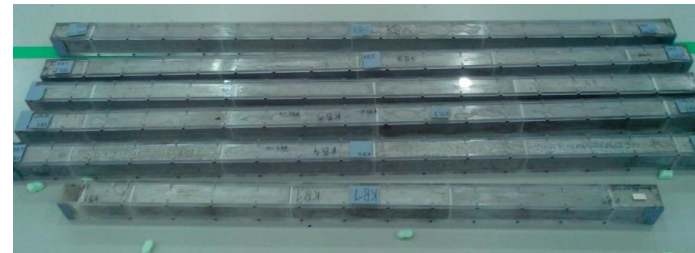
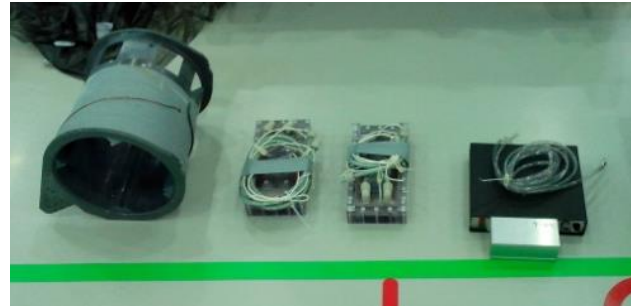
Installation of the red frame

SANS2

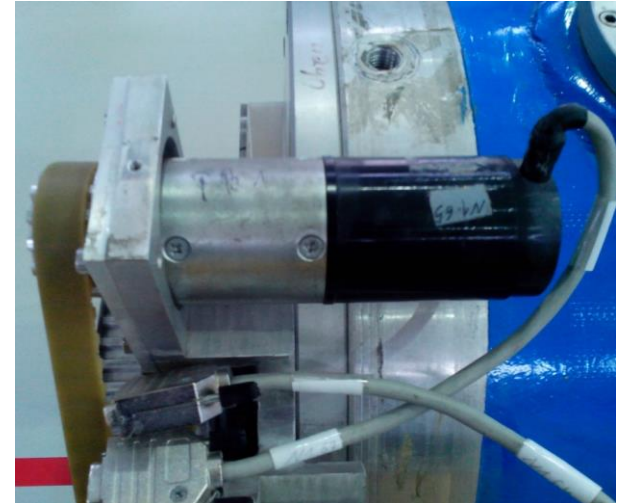
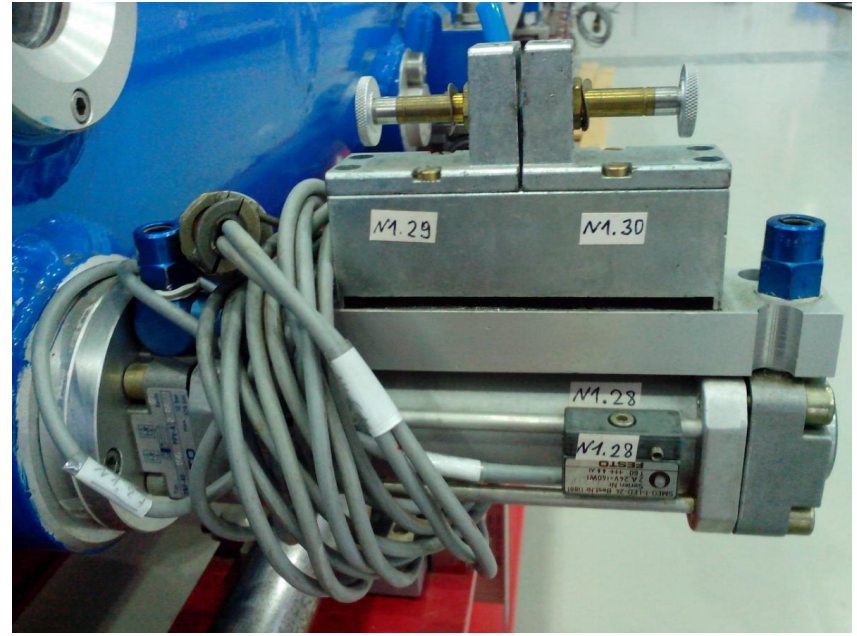


Installation of the collimation tubes

SANS2



Collimation tube





- ✓ All cables was connected
- ✓ Control program was recovered
- ✓ All motors on the collimation tube were set in motion

- ✓ Special work place for testing
- ✓ At the moment creates a database of all stepping motors



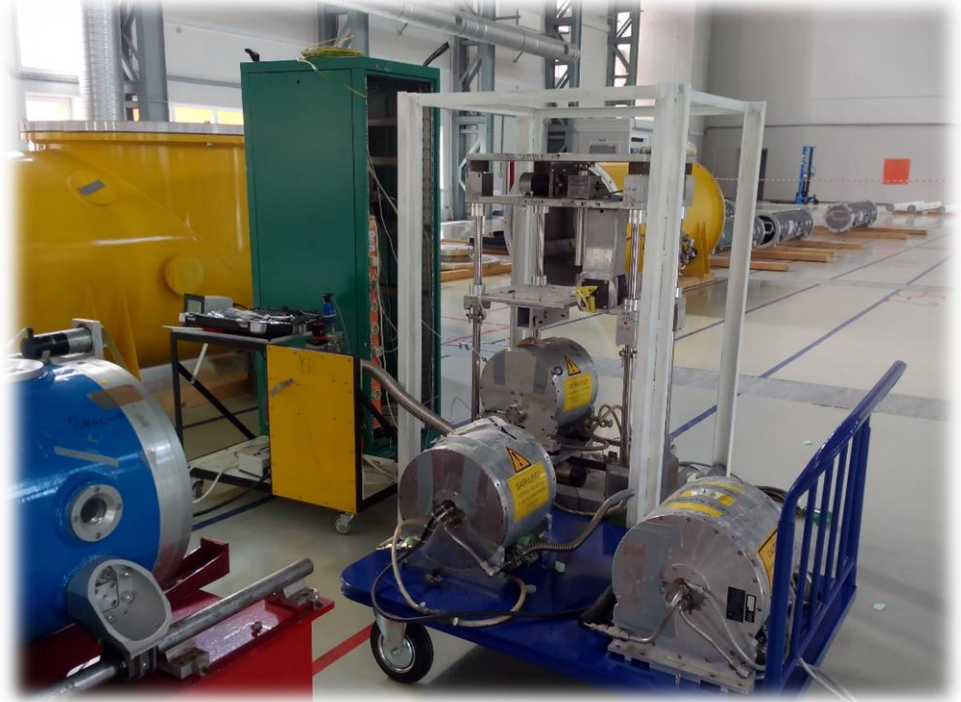
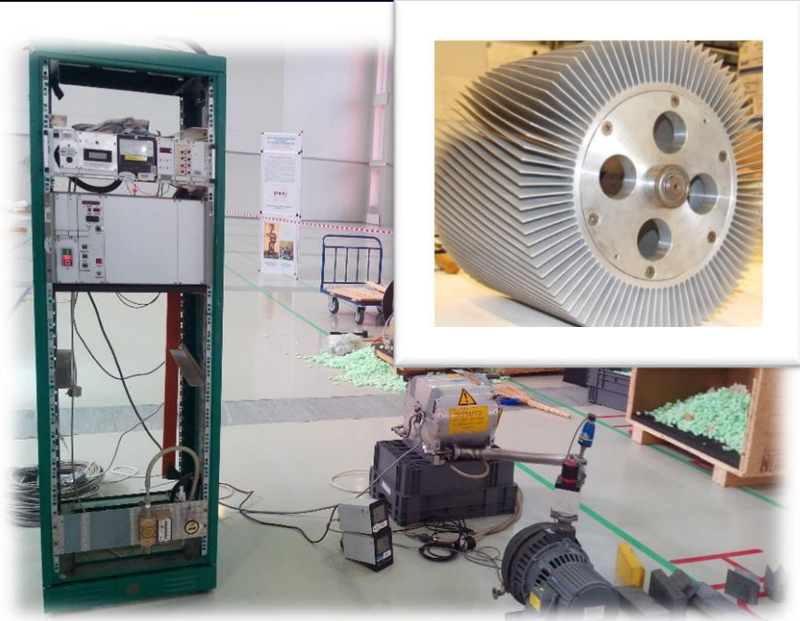


✓ Mounting
of Detector tube

✓ Installation
of the air cushions



Test of Velocity Selector



- ✓ Test of selector at maximum speed 4000 rpm was performed
- ✓ Selector was operated by the use of VS-rack and of the computer

Restoration and test of pumps

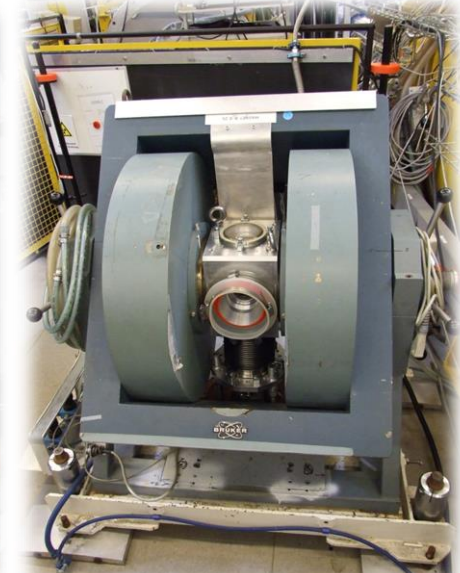
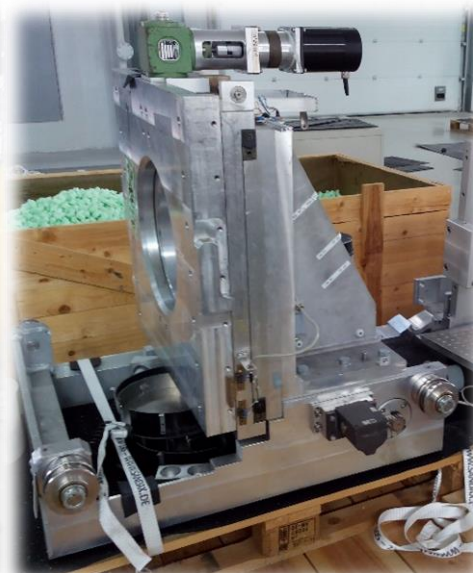
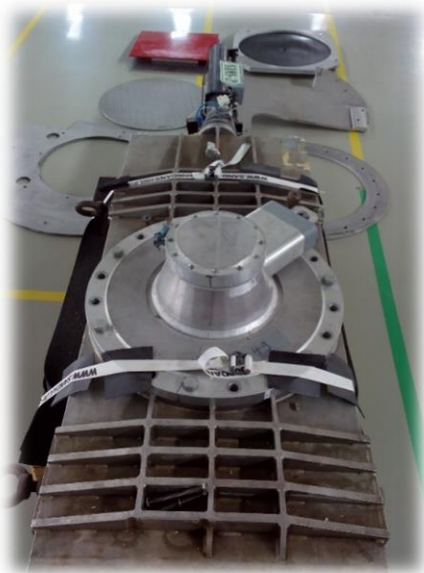
- ✓ All pumps were transported to the 11 building for testing
- ✓ Practically all pumps are serviceable



Nearest plans

SANS2

- ✓ Installation of the “schiber”
- ✓ Installation of the grid-system on the detector tube
- ✓ Test of the sample table
- ✓ Making of the support for installation of the detector's trolley
- ✓ Installation of trolley for detector
- ✓ Test of pneumatic motors on the collimation tube
- ✓ Create a support for the raise of SANS-2 at 50 cm



PLANNED UPGRADE:

- ✓ Polarizer (transmitted)
- ✓ Neutron guides
- ✓ Electronics
- ✓ Detector
- ✓ Raise the level of SANS-2 and install facilities for the legs (+ 0.5 m)

RECONSTRUCTION (TEST):

- ✓ Velocity selector
- ✓ Collimation tube
- ✓ Detector tube
- ✓ Sample environment
- ✓ Vacuum system

- ✓ CONTROL PROGRAM

We really appreciate to Helmut Eckerlebe
for his help and support



Thank you for your attention