

Neutron Delivery Systems NDS 2023



Report of Contributions

Contribution ID: 1

Type: **not specified**

Welcome : Registration and networking with light lunch buffet

Monday, 10 July 2023 11:00 (2 hours)

Presenter: KELLEHER, Sarah

Contribution ID: 2

Type: **not specified**

Industrial Exhibition & Morning Coffee

Tuesday, 11 July 2023 08:00 (1 hour)

Contribution ID: 3

Type: **not specified**

Industrial Exhibition & Coffee

Tuesday, 11 July 2023 12:40 (1h 20m)

Swiss neutronics

AVS

Nortemecanica

Boron Rubbers India

Mirrotron

RHP-Technology

HDS

Olivier caunt

Contribution ID: 4

Type: **not specified**

Final Speech & Closing

Wednesday, 12 July 2023 15:10 (20 minutes)

Contribution ID: 5

Type: **not specified**

Optional visits of ILL installations

Wednesday, 12 July 2023 15:30 (1h 30m)

Contribution ID: 6

Type: **not specified**

ILL 2023 program and long shutdown activities

Monday, 10 July 2023 13:10 (20 minutes)

In 2020, the ILL launched the multiannual ILL20-23 programme, which combines a major upgrade of the instrument suite (Endurance) with additional security and safety improvements for the reactor operations. ILL20-23 has been conducted based on a master resource-loaded programme schedule for coordinating instrumentation work and reactor activities during long shutdowns, whilst securing a maximum number of reactor cycles.

We will present the program organisation and way of operating as well as the work achieved during the most recent 2021-2022 long reactor shutdown period, a crucial part of the ILL20-23 programme. Dozens of ILL employees have indeed been involved in what has been a particularly intense period. The work has called for concerted efforts and goodwill of ILL staff within the Projects and Techniques (DPT), Reactor (DRe) and the Science Division (DS) and the Administration division. As a result, the H1H2 long shutdown has been completed in line with its forecasted 16-month duration and on budget, leading to unpreceding reliability and safety levels of its neutron reactor, the delivery of a fully modernised H24 guide, the primary part of the future H15 guides as well as a number of new world-class instruments now in operation.

Presenter: BEAUCOUR, Jerome**Session Classification:** Session 1

Contribution ID: 7

Type: **not specified**

Renewal of the H1-H2 Guide System at the ILL Research Reactor

Monday, 10 July 2023 13:30 (20 minutes)

Presenter: KREUZ, Michael (Institut Laue-Langevin)

Session Classification: Session 1

Contribution ID: 8

Type: **not specified**

Innovative neutron guide replacement at the Institut Laue Langevin: The H24 (thermal) and H15 & H16 (cold) neutron guides

Monday, 10 July 2023 14:10 (20 minutes)

Presenters: DEWHURST, Charles (ILL); GIROUD, benjamin

Session Classification: Session 1

Contribution ID: 9

Type: **not specified**

Recent achievements in advanced diffractive optics for neutron monochromators at ILL

Monday, 10 July 2023 15:00 (20 minutes)

Recent achievements in advanced diffractive optics for neutron monochromators at ILL

Co-authors: MESTRALLET, Benoit; PHILIT, Florian; BARNEAUD, Franck; MICHALLAT, Sandrine

Presenter: COURTOIS, Pierre

Session Classification: Session 2

Contribution ID: **10**

Type: **not specified**

Vertical to horizontal beam double monochromator for reflectometry at BNC

Monday, 10 July 2023 15:20 (20 minutes)

Presenter: Mr TAMAS, Veres

Session Classification: Session 2

Contribution ID: 11

Type: **not specified**

Hybrid neutron monochromator systems

Monday, 10 July 2023 15:40 (20 minutes)

Presenter: FREUND, Andreas

Session Classification: Session 2

Contribution ID: 12

Type: **not specified**

KOMPASS – the polarized cold neutron triple-axis spectrometer optimized for polarization analysis

Monday, 10 July 2023 16:40 (20 minutes)

Presenter: GORKOV, Dmitry (University of Cologne / FRMII)

Session Classification: Session 3

Contribution ID: 13

Type: **not specified**

Realization of an advanced broadband supermirror solid-state neutron polarizer for fundamental physics applications

Monday, 10 July 2023 17:00 (20 minutes)

Presenter: BIGAULT, Thierry

Session Classification: Session 3

Contribution ID: 14

Type: **not specified**

Cold Neutron Guide Test Station with Polarization Analysis at HANARO

Monday, 10 July 2023 17:20 (20 minutes)

Presenter: KIM, KI-Yeon (Korea Atomic Energy Research Institute)

Session Classification: Session 3

Contribution ID: 15

Type: **not specified**

Planned upgrade of the primary spectrometer of OSIRIS

Tuesday, 11 July 2023 09:00 (20 minutes)

Presenter: PERRICHON, Adrien

Session Classification: Session 4

Contribution ID: 16

Type: **not specified**

The use of Copper substrates for Neutron guides at ESS

Monday, 10 July 2023 14:30 (20 minutes)

Presenter: SCHWEIGER, Hansdieter (European Spallation Source)

Session Classification: Session 1

Contribution ID: 17

Type: **not specified**

Neutron shielding and transport calculations for the post-beryllium replacement HFIR cold guide hall

Tuesday, 11 July 2023 09:20 (20 minutes)

Presenter: GRAMMER, Kyle (Oak Ridge National Laboratory)

Session Classification: Session 4

Contribution ID: **18**

Type: **not specified**

Modified Collimator for Narrow Fast Neutron Beams in Neutron Therapy

Tuesday, 11 July 2023 10:20 (20 minutes)

Presenter: SHEHADA, Abdullah (National Research Tomsk Polytechnic university)

Session Classification: Session 5

Contribution ID: 19

Type: **not specified**

Design and expected performance of the neutron guide systems at Breazeale Reactor at Penn State University

Tuesday, 11 July 2023 10:40 (20 minutes)

Presenter: MARKO, Marton (Centre for Energy Research)

Session Classification: Session 5

Contribution ID: 20

Type: **not specified**

Progress towards production of pulsed 2 keV and 24 keV neutrons, using neutron moderators and filters

Tuesday, 11 July 2023 11:00 (20 minutes)

Presenter: PATEL, Pratyush (University of Massachusetts, Amherst)

Session Classification: Session 5

Contribution ID: 21

Type: **not specified**

A Monte Carlo Simulation Framework for Nested Mirror Optics – Approach and Applications

Tuesday, 11 July 2023 14:00 (20 minutes)

Presenter: WAGNER, Richard

Session Classification: Session 6

Contribution ID: 22

Type: **not specified**

The new versions 3.5 and 4.0 of the VITESS simulation package

Tuesday, 11 July 2023 14:20 (20 minutes)

Presenter: LIEUTENANT, Klaus (Forschungszentrum Jülich)

Session Classification: Session 6

Contribution ID: 23

Type: **not specified**

Nested Mirror Optics – Towards a New Generation of Neutron Transport Systems?

Tuesday, 11 July 2023 14:40 (20 minutes)

Presenter: HERB, Christoph (TUM/MLZ)

Session Classification: Session 6

Contribution ID: 24

Type: **not specified**

Monte-Carlo simulations of the new radiation shielding at the thermal beamport SR8 @ FRM II with SERPENT 2

Tuesday, 11 July 2023 15:40 (20 minutes)

Presenter: HAUF, Christoph (MLZ)

Session Classification: Session 7

Contribution ID: 25

Type: **not specified**

Overview on Shielding Analyses for the VENUS Instrument at SNS

Tuesday, 11 July 2023 16:00 (20 minutes)

Presenter: POPOVA, Irina (ORNL)

Session Classification: Session 7

Contribution ID: 26

Type: **not specified**

Shielding Analysis of the CHES Instrument at the Spallation Neutron Source Second Target Station

Tuesday, 11 July 2023 16:20 (20 minutes)

Presenter: MILLER, Thomas (Oak Ridge National Laboratory)

Session Classification: Session 7

Contribution ID: 30

Type: **not specified**

Commissioning of the ultracold neutron guide system for the n2EDM experiment at PSI

Wednesday, 12 July 2023 13:30 (20 minutes)

Presenter: DOORENBOS, Cornelis (Paul Scherrer Institute)

Session Classification: Session 10

Contribution ID: 31

Type: **not specified**

Ultra-cold neutron source using He-II at TRIUMF

Wednesday, 12 July 2023 13:50 (20 minutes)

Presenter: MISHIMA, Kenji (KEK)

Session Classification: Session 10

Contribution ID: 32

Type: **not specified**

Brightify: A tool for calculating brightness in neutron sources (under the topic of simulation of neutron sources and neutron transport)

Wednesday, 12 July 2023 14:10 (20 minutes)

Presenter: AKHYANI, Mina (EPFL, Switzerland)

Session Classification: Session 10

Contribution ID: 33

Type: **not specified**

An Update on the Development of a Cold Neutron Source and Cold Neutron Beam Facilities at the Penn State Breazeale Reactor

Wednesday, 12 July 2023 09:00 (20 minutes)

A third generation, mesitylene moderated cold neutron source (CNS) was designed, built and is being installed at the Penn State Breazeale Reactor (PSBR) at the Radiation Science and Engineering Center (RSEC). The main components of the PSU-CNS are a cold source cryocooler system and neutron guide system. Components of the cold source cryocooler system are a vacuum system, helium circulating and buffer system, compressor system, and mesitylene moderator. Mesitylene, a room temperature liquid, is frozen to solid form in a chamber to act as the cooling moderator. Circulating helium lines are attached to a cryocooler used to cool and maintain cold temperature of the mesitylene moderator using the method of forced flow helium gas circulated between the refrigeration unit (Cryocooler). A helium loop cools and maintains a cold neutron mesitylene moderating material at about 20 K in a 10 cm diameter aluminum chamber located inside the D₂O tank of the PSBR. The mesitylene moderator chamber, circulating helium lines, and moderator lines are isolated in a vacuum system for isolation from thermal transfer. The cold neutrons coming from the mesitylene chamber are transported out of the biological shield of the reactor with three super-mirror neutron guides. The in-pile neutron guide system of the PSU-CNS contains 3 independently adjustable in-pile segments. The supermirror neutron guide cross-sections are GT1- 40 x 40 mm, GT2- 25 mm x 70 mm, GT3- 25 mm x 25 mm constructed of borated float glass each ~5 mm thick with a surface coating of m=3 QC on all sides. Each is a 0 m radius straight guide of 2.8m in length. Each in-pile guide is separated with material effective for shielding neutron and gamma radiation. The shielding and guide section with independent adjustment features has been designed to integrate into the in-pile vacuum housing, with optimal guide alignment with the moderator chamber. The three in-pile guides extend to out-of-pile guides with several different sections for Small Angle Neutron Scattering, Neutron Depth Profiling and Prompt Gamma Activation guide systems with straight guides, beam benders, and parabolic focusing guides with different surface coatings. The neutron guide elements were designed and are being built by Mirrotron Ltd. Budapest, Hungary. The PSBR is a 1 MW, TRIGA with moveable core in a large pool and with pulsing capabilities. In steady-state operation at 1 MW, the thermal neutron flux is 1×10^{13} n/cm²sec at the edge of the core and 3×10^{13} n/cm²sec at the central thimble. The PSBR can also pulse with the peak flux for maximum pulse ~ 6×10^{16} n/cm²sec with pulse half width of ~10 msec. The RSEC facilities are heavily used for nuclear science and engineering research and education. A detailed description of the PSU-CNS will be presented.

Presenter: UNLU, Kenan (Penn State University)**Session Classification:** Session 8

Contribution ID: 34

Type: **not specified**

Investigation of Pancake-like Moderator-Reflector Structure for the High Brilliance Neutron Source (HBS)

Wednesday, 12 July 2023 09:20 (20 minutes)

Presenter: CHENG, Junyang

Session Classification: Session 8

Contribution ID: 35

Type: **not specified**

The Jülich High-Brilliance Neutron Source Project

Wednesday, 12 July 2023 09:40 (20 minutes)

Presenter: ZAKALEK, Paul

Session Classification: Session 8

Contribution ID: 59

Type: **not specified**

Efficient Neutron Transport and Imaging with Magnetic Lenses

Wednesday, 12 July 2023 12:10 (20 minutes)

Magnetic lenses have been developed for neutron beam transport. When the spin is parallel to the magnetic field, the neutron beam is focused by a sextupole magnet due to the magnetic dipole moment of the neutrons. On the other hand, the rest of the neutron beam is defocused. We are developing a powerful permanent magnet type sextupole lens which enables focal length modulation in synchronization with TOF. The status of the development research will be presented.

Primary authors: Dr IWASHITA, Yoshihisa (Kyoto University); FUWA, Yasuhiro (Japan Atomic Energy Agency); Dr KURIYAMA, Yasutoshi (Kyoto University); Dr SHIMIZU, Hirohiko (Nagoya University); Dr KITAGUCHI, Masaaki (Nagoya University); Dr HIROTA, Katsuya (High Energy Accelerator Research Organization); Dr YAMADA, Masako (High Energy Accelerator Research Organization)

Presenter: Dr IWASHITA, Yoshihisa (Kyoto University)

Session Classification: Session 9

Contribution ID: **63**

Type: **not specified**

Welcome

Monday, 10 July 2023 13:00 (10 minutes)

Contribution ID: 64

Type: **not specified**

11B/10B-modulated boron carbide neutron interference mirrors

Monday, 10 July 2023 16:00 (20 minutes)

Presenter: BIRCH, Jens (Linköping University)

Session Classification: Session 2

Contribution ID: 65

Type: **not specified**

Detection of hydrate plugs inside submarine pipelines using neutron activation analysis

Tuesday, 11 July 2023 11:20 (20 minutes)

Presenter: BOUAT, Sophie (Science-S.A.V.E.D.)

Session Classification: Session 5

Contribution ID: 66

Type: **not specified**

Neutron beams with Intrinsic time structures - methods and possible applications

Tuesday, 11 July 2023 15:00 (20 minutes)

Presenter: GÄHLER, Roland

Session Classification: Session 6

Contribution ID: 67

Type: **not specified**

Characterization of intense cold neutron beams for superthermal ultracold neutron sources

Wednesday, 12 July 2023 14:30 (20 minutes)

Presenter: DEGENKOLB, Skyler

Session Classification: Session 10

Contribution ID: 70

Type: **not specified**

Development of a UCN guide and other handling devices at J-PARC with pulsed UCNs

Wednesday, 12 July 2023 14:50 (20 minutes)

Presenter: IMAJO, Sohei (Osaka University)

Session Classification: Session 10

Contribution ID: 71

Type: **not specified**

Australian Centre for Neutron Scattering Recent Upgrades and Future Plans

Tuesday, 11 July 2023 09:40 (20 minutes)

Presenter: LEE, Stan (ANSTO)

Session Classification: Session 4

Contribution ID: 72

Type: **not specified**

Neutron Mirror with Magnetic Repulsive Wall

Wednesday, 12 July 2023 11:50 (20 minutes)

Presenter: FUWA, Yasuhiro (Japan Atomic Energy Agency)

Session Classification: Session 9

Contribution ID: 74

Type: **not specified**

Beam monitoring strategy at the European Spallation Source

Wednesday, 12 July 2023 11:10 (20 minutes)

Presenter: KATSIIOULAS, Ioannis (European Spallation Source)

Session Classification: Session 9

Contribution ID: 75

Type: **not specified**

The ESS moderators

Wednesday, 12 July 2023 10:00 (20 minutes)

Presenter: ZANINI, Luca

Session Classification: Session 8

Contribution ID: 76

Type: **not specified**

Optimization of neutron production at ORNL's Second Target Station

Wednesday, 12 July 2023 11:30 (20 minutes)

Presenter: ZAVORKA, Lukas

Session Classification: Session 9

Contribution ID: **80**

Type: **not specified**

STS Standardized Neutron Delivery System Components

Tuesday, 11 July 2023 16:40 (20 minutes)

Presenters: HART, Cameron (Oak Ridge National Laboratories); TORRES, Peter (Oak Ridge National Laboratory)

Session Classification: Session 7

Contribution ID: 81

Type: **not specified**

The Compact Accelerator based Neutron Source (CANS) project “LvB” at Martonvásár, Hungary¹

Wednesday, 12 July 2023 10:20 (20 minutes)

Presenter: LUDANYI, Zsolt (Mirrotron Ltd.)

Session Classification: Session 8

Contribution ID: 82

Type: **not specified**

Technical presentation of H15 & H24 guides

Monday, 10 July 2023 13:50 (20 minutes)

Presenter: GIROUD, benjamin

Session Classification: Session 1