

Workshop on Neutron Resonance Densitometry (NRD)

JRC-IRMM and JAEA (ISCN¹ & NSEC²) are pleased to announce a workshop on technologies to characterize nuclear materials using pulsed neutron sources. The workshop will be held on 4 – 5 March 2015 at JRC-IRMM in Geel (Belgium).

Strong and compact pulsed neutron sources are getting a wide interest as a tool for non-destructive analysis (NDA). This is mainly due to recent progress in the development of accelerator technologies and related NDA methods and techniques. The main objective of the workshop is to present the use of Neutron Resonance Densitometry (NRD) as a NDA technique to characterize nuclear materials. NRD is a neutron resonance spectroscopic method based on the time-of-flight technique using a pulsed neutron beam. Its applicability to quantify fissile materials in complex materials such as debris of the Fukushima Daiichi reactors will be discussed. In addition, an experiment is planned to demonstrate the performance of NRD as a tool for both elemental and isotopic analysis. A special session will be devoted to present other neutron NDA techniques using pulsed neutron sources and discuss perspectives on their use in particular in the field of nuclear safeguards and security.

Date

4 – 5 March 2015

Place

JRC-IRMM
Retieseweg 111, B - 2440 Geel, Belgium

Topics

- Neutron Resonance Densitometry (NRD)
- Neutron Resonance Transmission Analysis (NRTA)
- Neutron Resonance Capture Analysis (NRCA)
- Prompt Gamma-ray Analysis (PGA)
- Innovative NDA techniques
- Pulsed neutron sources

Demonstration of NRD

NRD is a technique that is being developed as part of a collaborative effort of the JRC-IRMM and JAEA (ISCN & NSEC). The basic principles will be presented and a demonstration experiment will be performed.

Registration

In order to attend the workshop and provide access to the site a registration form has to be completed. No registration fee is charged.

Travel Fee

At the expense of organization of attendee

Accommodations

TBD

Transportation

TBD

Contact Person

JRC-IRMM
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¹ ISCN: Integrated Support Center for Nuclear Nonproliferation and Nuclear Security

² NSEC: Nuclear Science and Engineering Center

Workshop on Neutron Resonance Densitometry

4 – 5 March, 2015, JRC-IRMM, Geel (Belgium)

Organized by JRC-IRMM and JAEA (ISCN & NSEC)

Program (Temporary)

4 March, 2015

13:30 – 13:40	Opening of the workshop	E. Anklam S. Abousahl	JRC – IRMM JRC – HQ
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Introduction of Neutron Resonance Densitometry (NRD)

13:40 – 14:05	Principles of NRTA and NRCA	P. Schillebeeckx	JRC – IRMM
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14:05 – 14:30	Challenge towards quantification of SNM from Fukushima Daiichi's by NRD	H. Harada	JAEA – NSEC
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Demonstration (1)

14:30 – 14:50	Explanation of demonstration	J. Heyse	JRC – IRMM
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14:50 – 15:30	Visit TOF-facility GELINA		
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14:50 – 15:30 Coffee Break

Progress in the development of NRD

15:50 – 16:15	Results of NRTA on nuclear materials	S. Kopecky	JRC – IRMM
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16:15 – 16:40	How to measure prompt γ -rays under strong background conditions	M. Koizumi	JAEA – NSEC
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16:40 – 17:05	Analysis of heterogeneous samples	B. Becker	JRC – IRMM
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17:05 – 17:30	A conceptual NRD system and its performance evaluation	H. Tsuchiya	JAEA – NSEC
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5 March, 2015

Demonstration (2)

09:00 – 09:30 Qualitative discussion of NRTA data C. Paradela JRC – IRMM

Other active neutron NDA technologies

09:30 – 09:55 NDA methods developed at KURRI K. Nakajima Kyoto Univ.

09:55 – 10:20 NDA methods developed at JRC-ITU B. Pedersen JRC-ITU

10:20 – 10:45 NDA R&D activities at JAEA M. Kureta JAEA – NSEC

10:45 – 11:10 NDA R&D activities in US TBD DOE/NNSA

(Relating to DDA and DG Techniques)

11:10 – 11:30 *Coffee Break*

Demonstration (3)

11:30 – 12:10 Presentation of quantitative NRTA results S. Kopecky JRC – IRMM

12:10 – 12:30 Presentation of quantitative NRCA results JRC – IRMM

12:30 – 13:45 *Lunch*

Importance of NDA and future prospects

13:45 – 14:10 Importance of NDA for nuclear safeguards in the EU P. Schwalbach DG - ENER

14:10 – 14:35 NDA in IAEA TBD IAEA

14:35 – 15:00 NDA in US TBD DOE/NNSA

15:00 – 15:25 Development activities on NDA in Japan M. Seya JAEA – ISCN

15:25 – 15:50 NDA R&D opportunities at JRC W. Mondelaers JRC

15:50 – 16:00 Closing remarks Y. Naoi JAEA – ISCN

S. Abousahl JRC