KNDC Progress Report

Nuclear Data Center

Korea Atomic Energy Research Institute

June 07 - 10, 2016, CIAE

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Organization

Chief of Center
Dr. Lee Young-Ouk

Secretary
Ms. Lee kyung-Jin

Atomic/ Molecule

Dr. Rhee Yong-Joo
(Neutron source by laser

Nuclear Data Evaluation

Dr. Cho Young-Sik
(Resonance)

Processing/ Validation

Mr. Gil Choong-Sup
(Library processing)

Application

Mr. Lee Cheol-Woo
(ITER, Accelerator shielding analysis)

Measurement

Dr. Song, Tae-Yung
(Measurement)

Reactor physics Lab.

Dr. Cho Jin-Young

Dr. Lee Hyun-Chul

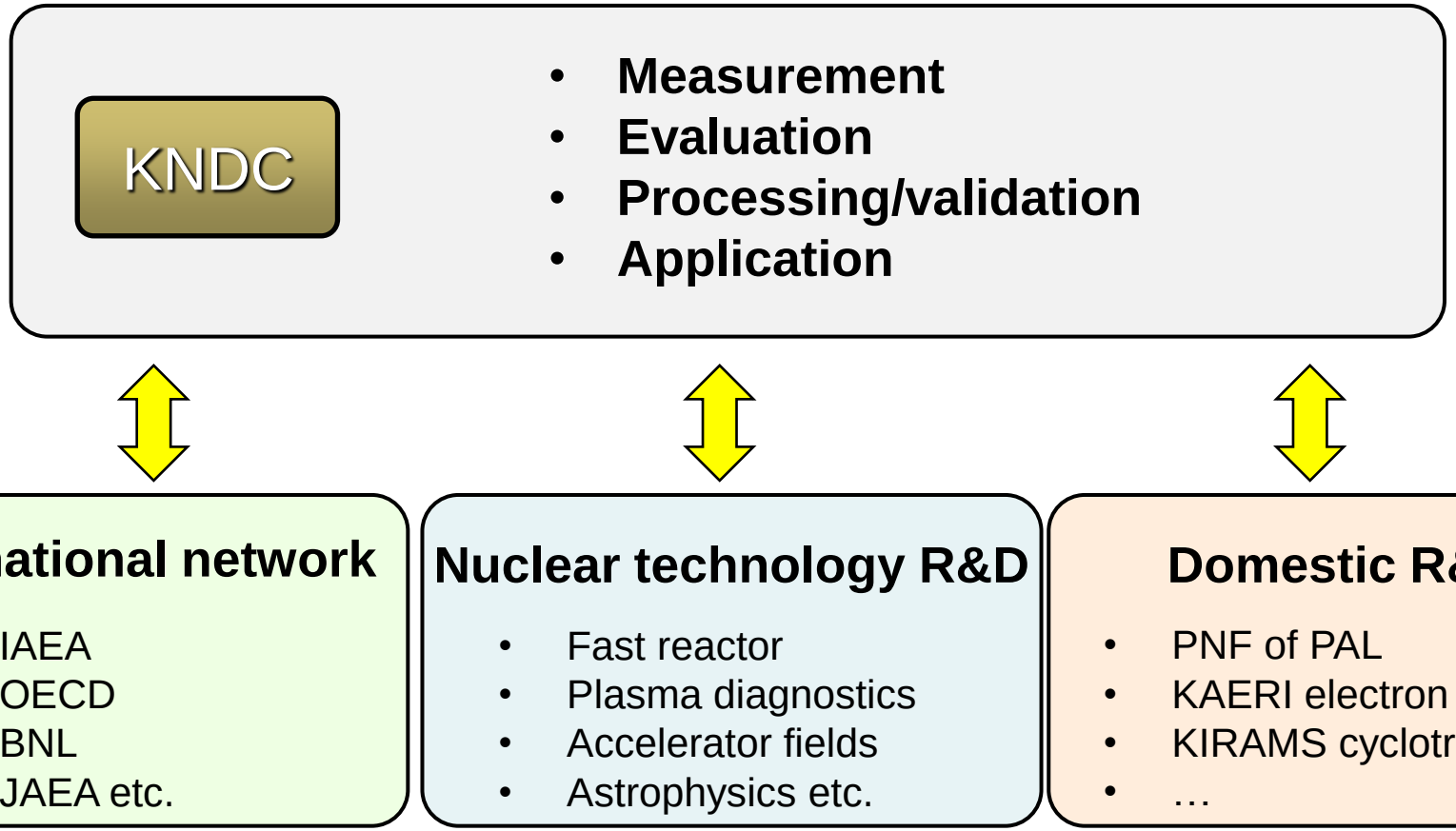
Dr. Han Tae-Young

Dr. Park Ho-Jin

- Code development of core analysis
- Research of Monte Carlo method

Mr. Lee Jong-Hwa
(Structure data)

Introduction



Introduction

➢ **In 2015**

Evaluation and method development for nuclear reaction data	- Production of nuclear data for nuclear fusion (W, Ta, Fe, Zr, Cr) - Evaluation of actinide nuclide (U-238 resonance)
Production and validation of atomic/molecular collision XS	- Calculation for electron-impact recombination XS (W^{q+}, q=44-46) - Construction of service system of web-based atomic/molecular modeling
Establishment of validation system of nuclear reaction/covariance data	- Production and validation of ACE-format library based on JEFF-3.1 - Construction of service system of web-based ACE library
Measurement of nuclear data and development of facility	- Licensing of KAERI TOF facility - Development of target device for fast neutron - Measurement of activation XS of Y - Measurement of neutron production XS (DDX)

Introduction

➢ International Cooperation

- **IAEA**
  - IAEA-KAERI joint CM: calculations for electron-impact recombination cross section of tungsten
  - EXFOR compilation of domestic experimental data: 18 entries

- **OECD/NEA**
  - Participation in the development of Generalized Nuclear Data (GND) in WPEC
  - Validation, verification and production for U-238 in resonance energy region (with GELINA)

- **BNL**
  - Improvement of EMPIRE code in cooperation with BNL

- **JNDC (via Kyushu Univ.)**
  - Measurement of heavy-ion nuclear reaction with Kyushu Univ.

EXFOR activity

➢ Compilation responsibility

- Neutron data and CPND from Korea (coordinated by NDS)

➢ Status

- EXFOR compilation progress (since NRDC2015 meeting)

- Number of new entries: 18
- Residual cross section (p, g, n)
- Isomeric ratio
- Neutron capture cross section

#	TRANS	ENTRY	SUBJECT	STATUS
1	G033	G3113	Gamma	EXFOR
2	G033	G3114	Gamma	EXFOR
3	D099	D7011	Charged particle	EXFOR
4	G033	G3115	Gamma	EXFOR
5	G033	G3116	Gamma	EXFOR
6	G033	G3117	Gamma	EXFOR
7	G033	G3118	Gamma	EXFOR
8	D101	D7012	Charged particle	EXFOR
9	G033	G3119	Gamma	EXFOR
10	D101	D7013	Charged particle	EXFOR
11	G035	G3120	Gamma	PRELIM
12	3172	30834	Neutron	EXFOR
13	3173	30835	Neutron	EXFOR
14	D102	D7014	Charged particle	EXFOR
15	D102	D7015	Charged particle	EXFOR
16	D103	D7016	Charged particle	EXFOR
17	D103	D7017	Charged particle	EXFOR
18	D103	D7018	Charged particle	EXFOR

➢ Checking tool

- JCPRG-exfor-tool

Facilities of Korea

➢ Existing facilities

Facility	Characteristics	Measurements
Electron linear accelerator (PAL)	• 100 MeV, 2.5 GeV linacs • Neutron production by 100 MeV linac • γ production by 100 MeV and 2.5 GeV linacs	• Total cross section • (n,γ) by neutron activation method • Isomeric yield ratio • Photo fission
Cyclotron (KIRAMS)	• p : 20- 50 MeV / 40 μA • d : 10- 25 MeV / 20 μA • α : 20- 50 MeV / 1 μA	• Activation cross section
Proton linear accelerator (KOMAC)	• 20 & 100 MeV linac	• Activation cross section

➢ Planned facilities

Facility	Characteristics	Status
Electron linear accelerator (KAERI)	• 17 MeV SC linac • Neutron production	• Accelerator is available • Conceptual design of TOF facility is completed
Heavy-ion accelerator (IBS)	• Cyclotron (70 MeV proton) • SC linac (H – U, 200 MeV/u(U)) • SC linac-1 (d (53 MeV), p (70 MeV)	• Accelerator will be available in 2019 • Planning for data measurements

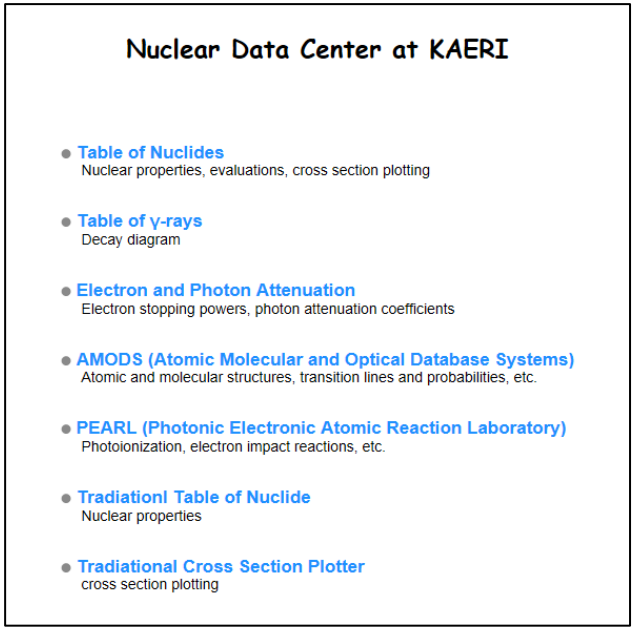
Cooperation with domestic groups

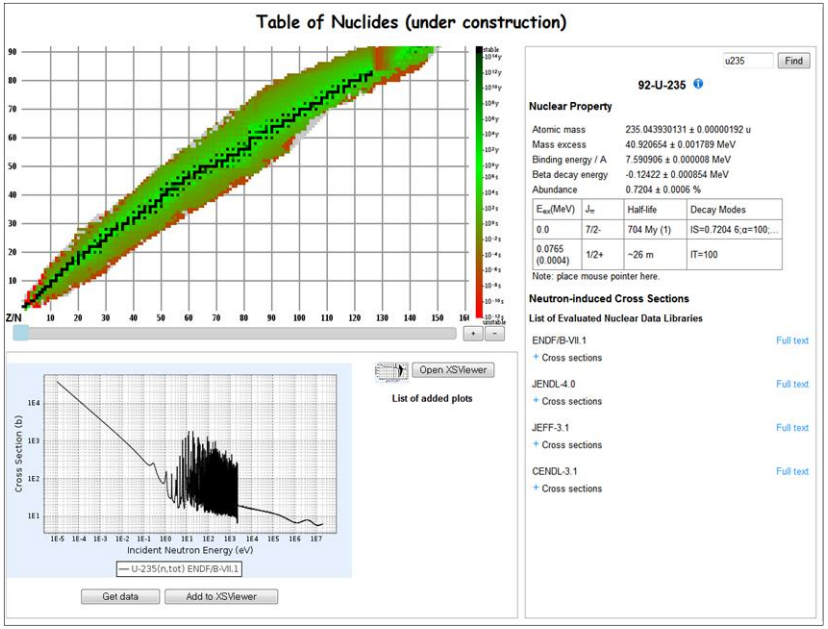
- **Workshop on nuclear data measurement and related subject**
  - December 3-4 in 2015, Pohang Accelerator Lab.
  - Organized by Kyungpook National Univ. (KNU)
  - Supported by Dongnam Institute of Radiological & Medical Sciences (DIRAMS), Pohang University of Science and Technology (POSTECh) and KNDC

- **Topics**
  - Facility for nuclear data measurement
  - Nuclear data evaluation and theoretical method
  - Nuclear data measurement
  - Detector, data acquisition system and related topics

Reconstruction of website

- **KNDC website** (http://atom.kaeri.re.kr)
  - The aim of this update is to pack more information on one page reducing the need to search across multiple locations.
  - The newly designed table of nuclide allows the used to easily navigate through the nuclides.
  - Continue to update the plot of cross section for the evaluated and measured nuclear data





Conclusions

- **The organization and mission of KNDC was introduced.**
- **EXFOR progress in KNDC was introduced.**
  - Compilation responsibility for domestic experiments
  - Since NRDC2015 meeting, EXFOR: 17, PRELIM: 1
- **Introduction for the specifications of Korea's facilities**
- **Cooperation with domestic group and website service**