

Experimental Activity in Japan

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1. Experiments in Each Facility
2. Project research on MA cross section
(JAERI, JNC, UNIV.,)

1. Experiments in Japan (1) (*under the project research)

1) Tohoku Univ.,; 90 MeV cyclotron

a) (p,xn), (d,xn) spectrum (thick, thin targets) @ 30-70 MeV [1]

b) DDX of fragment production for p and n @ 30-70 MeV [2]

c) Activation cross section for p and n @ 30-70 MeV [3]

* d) Fission cross section @ $E_n < 50$ keV, 30-90 MeV (planned)

2) Japan Atomic Energy Research Institute

a) 14 MeV cross section; activation, FNS

b) Activation for d-induced reaction, @40 MeV, for IFMIF, TIARA

* c) Development of 4π γ -spectrometer for MA (n, γ)

3) Japan Nuclear Fuel Cycle

a) (n, γ) of ^{238}Np , ^{237}Np , ^{107}Pd @ resonance and thermal [4]

* b) Development of 4π γ -spectrometer for Actinide (n, γ)

1. Experiments in Japan (2)

4) Tokyo Institute of Technology; 3 MeV Pelletron

a) (n, γ) of ^{129}I , ^{92}Zr , @ 10-550 keV

[5]

* b) Development of 4π γ - spectrometer for Actinide (n, γ)

5) Nagoya Univ.,;

a) (n, γ) cross sections @ near thermal,

b) neutron-induced activation @ 2.5 MeV (d-D)

6) Kyoto Univ., Research Reactor Institute: linac, Pb-spectrometer

a) (n, γ) cross sections @ thermal~50 keV; MA, FP

b) (n, f) cross sections @ thermal~50 keV; MA, FP

*c) Improvement of shielding/ collimation of linac TOF system

1. Experiments in Japan (3)

7) Osaka Univ.,

a) (n,charged particle) DDX for 14 MeV @ JAERI FNS

b) Fusion neutronics benchmark exp. @ JAERI FNS

8) Kyushu Univ.,

a) Neutron emission DDX @ 90-400 MeV, LANSCE

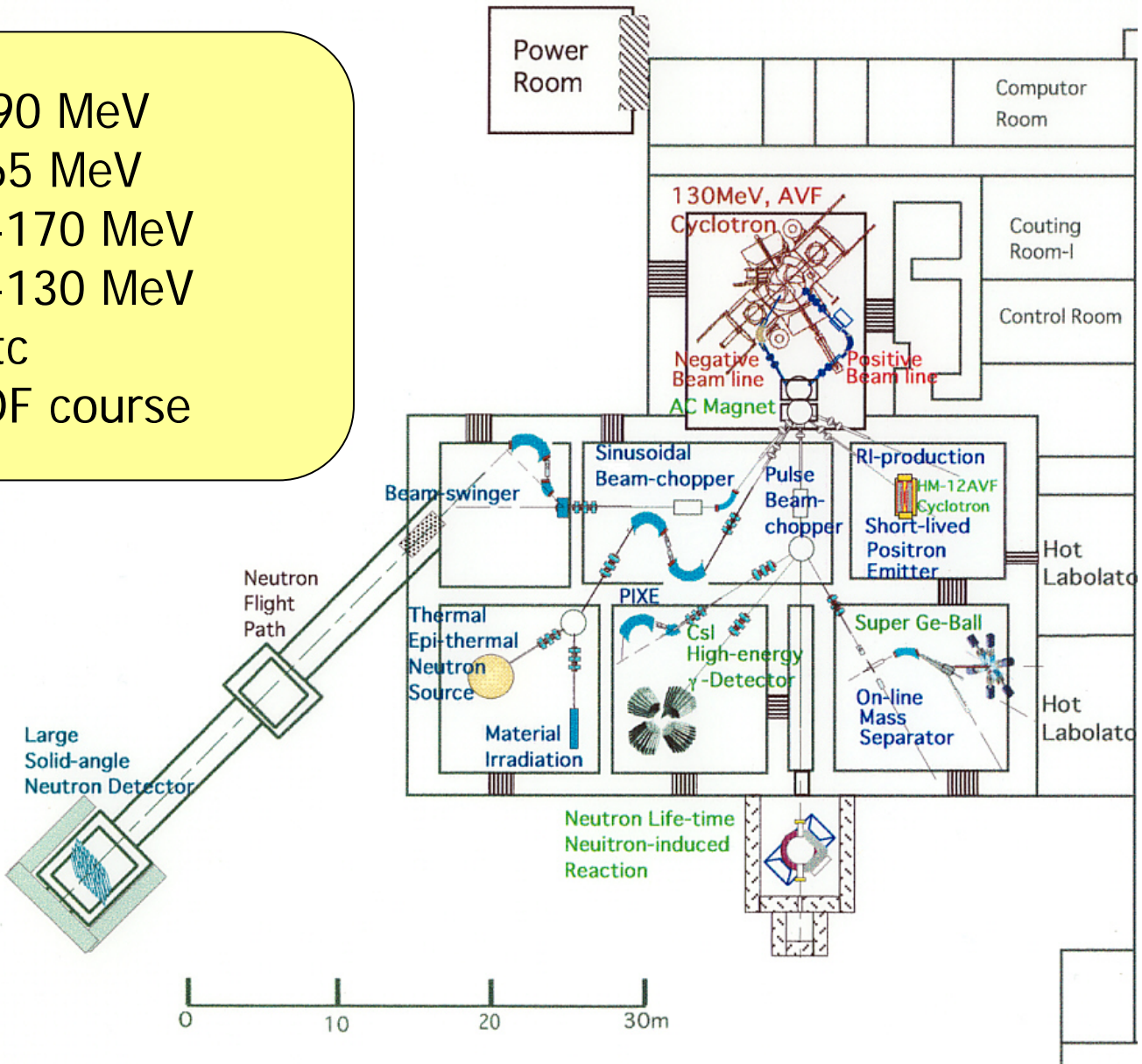
[6]

b) (p,p'x) of ^{51}V , ^{181}Ta @ $E_p=392$ MeV, Osaka Univ., RCNP

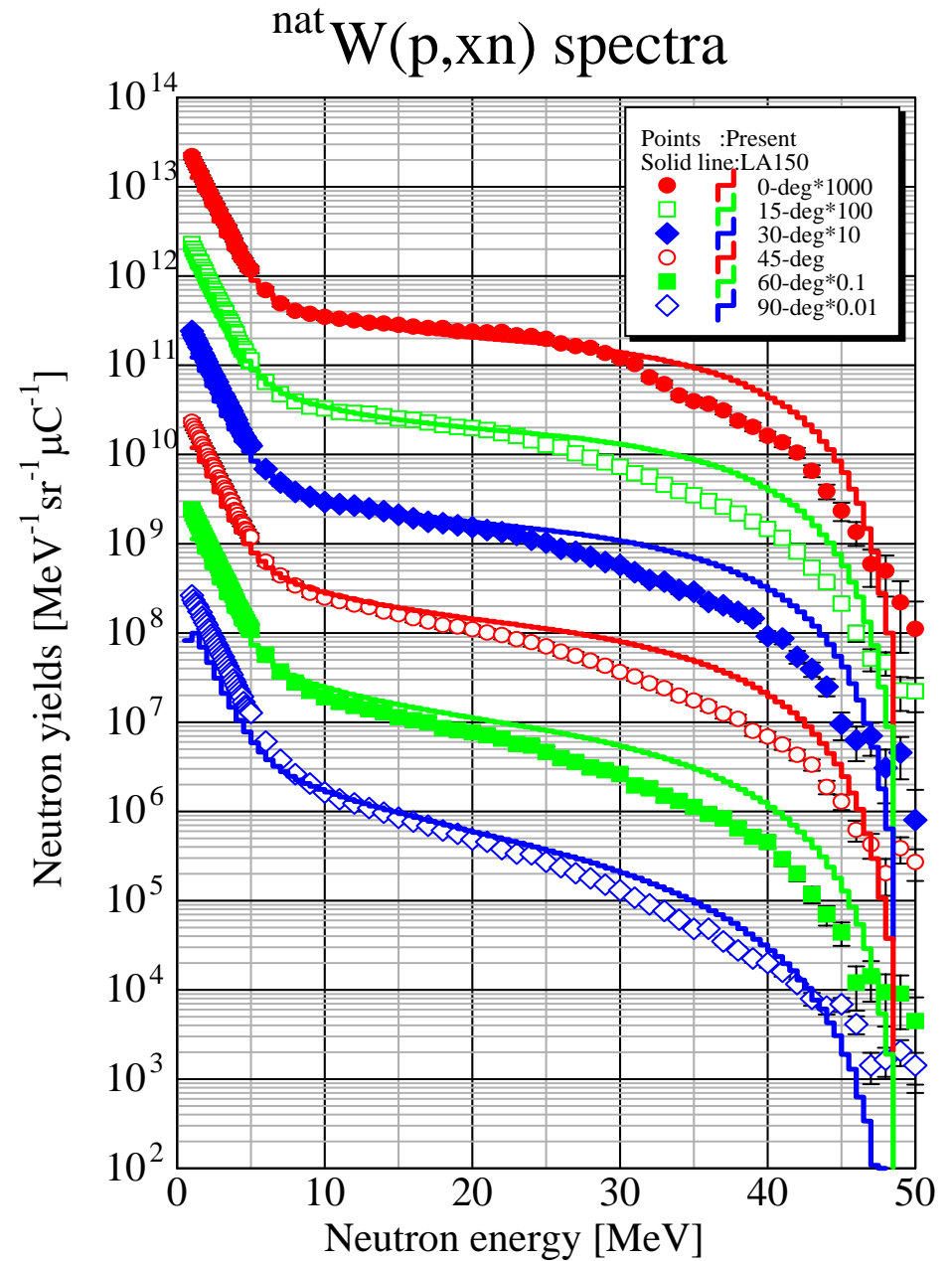
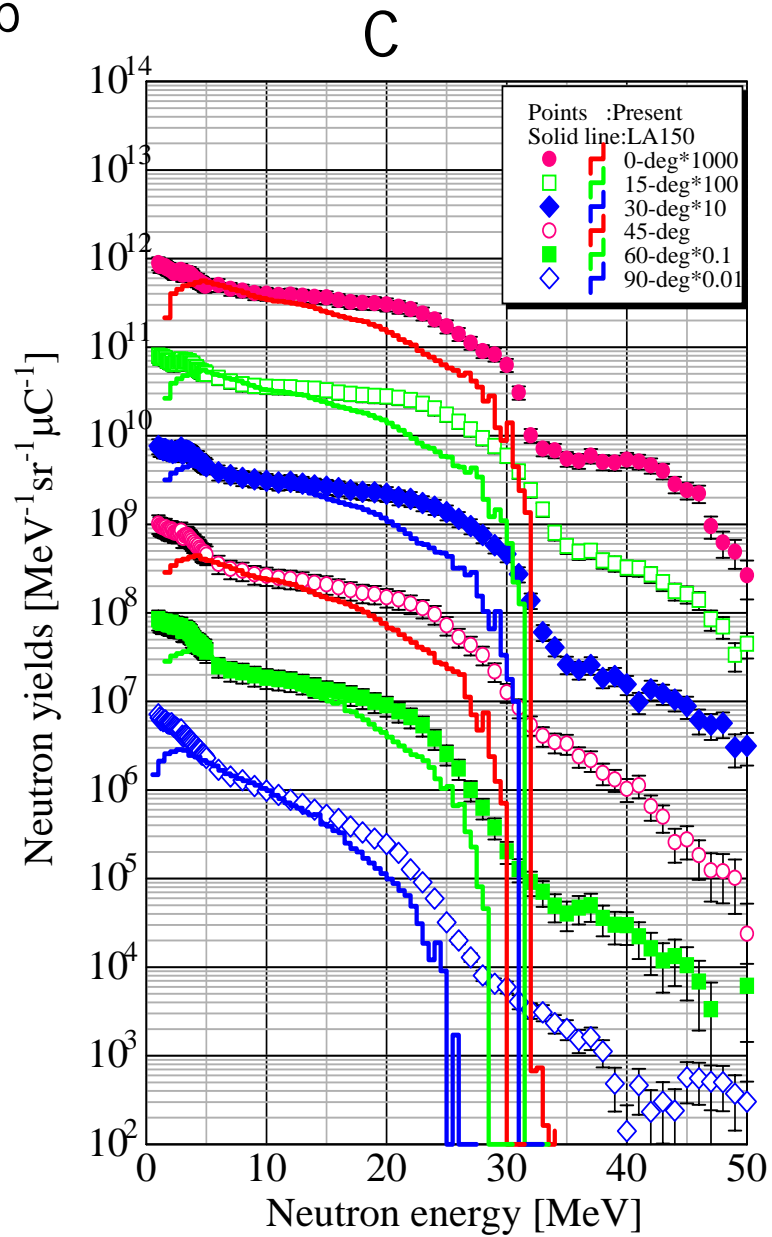
[1-1] Tohoku Univ., K=110 MeV AVF Cyclotron

protons 10-90 MeV
Deuterons 10-65 MeV
 ^3He 20-170 MeV
 ^4He 20-130 MeV
 C, N, O, Ne, Ar etc
 Beam swinger TOF course

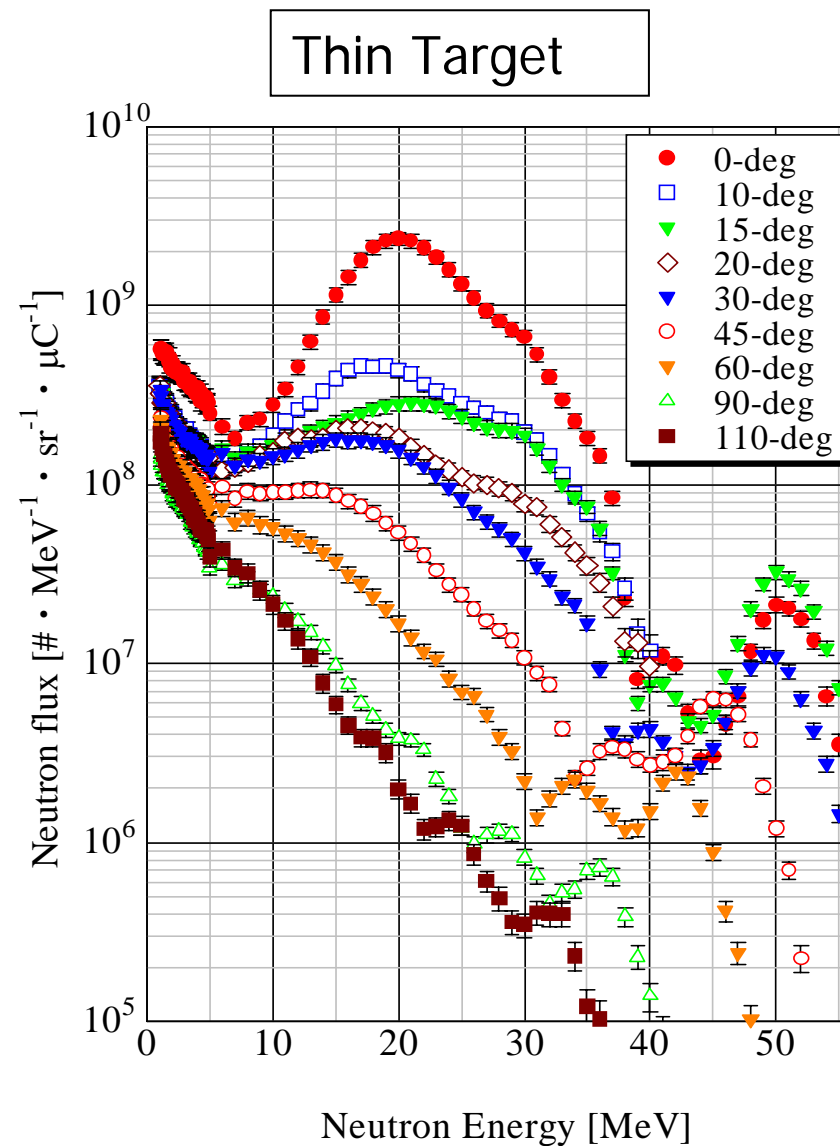
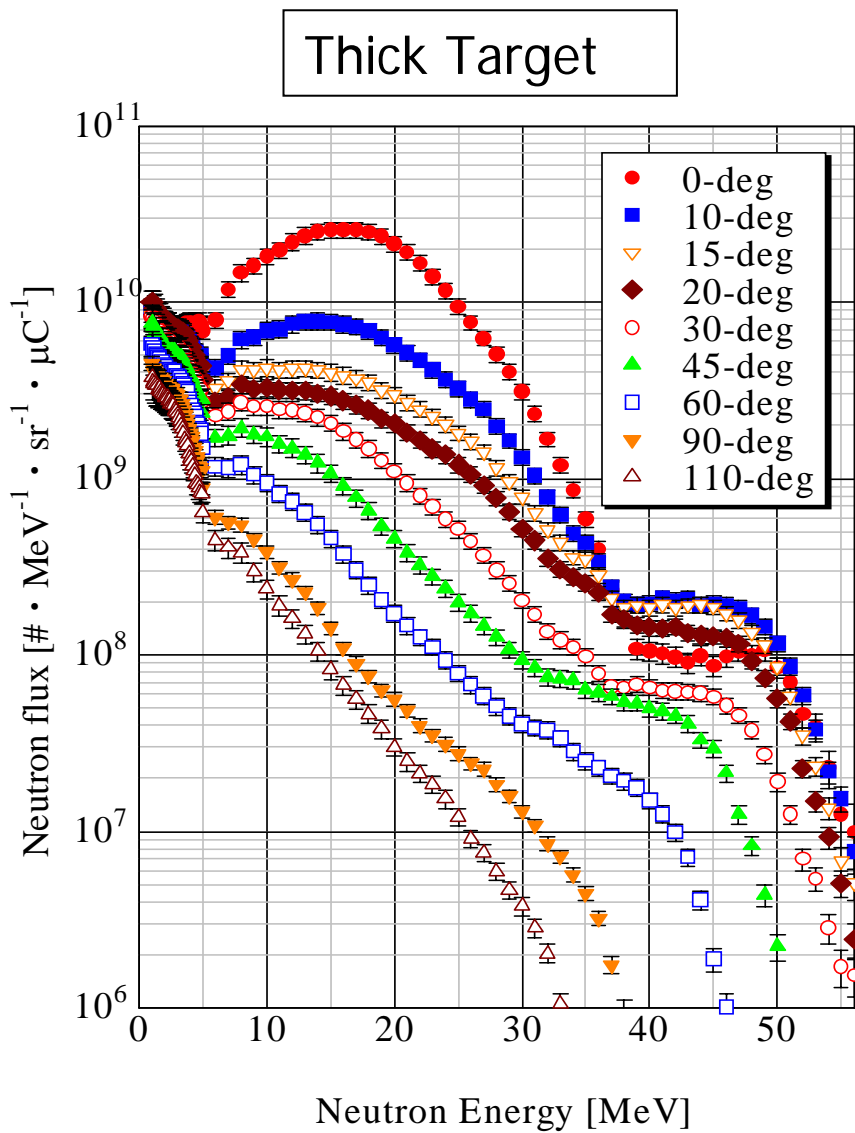
1. (p,n), (d,n)
2. Activation by
 p, d, n
3. Fragment
 production



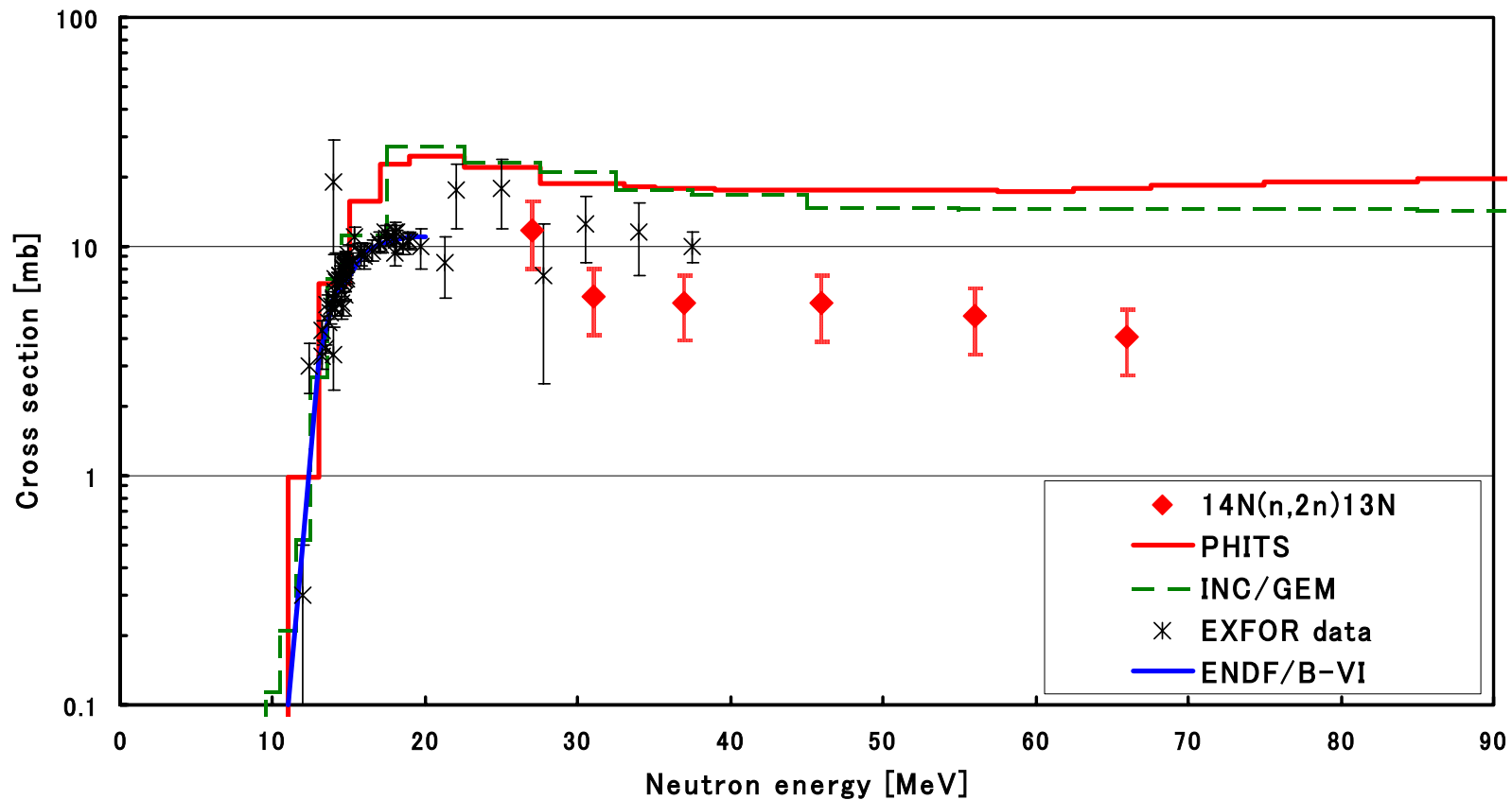
[1-2] (p,n) spectra (TTY) @70,50,35 MeV ; C, Al, Fe, Cu, Ta, W, Pb



[1-3] Li (d,n) spectra @Ed=40 MeV



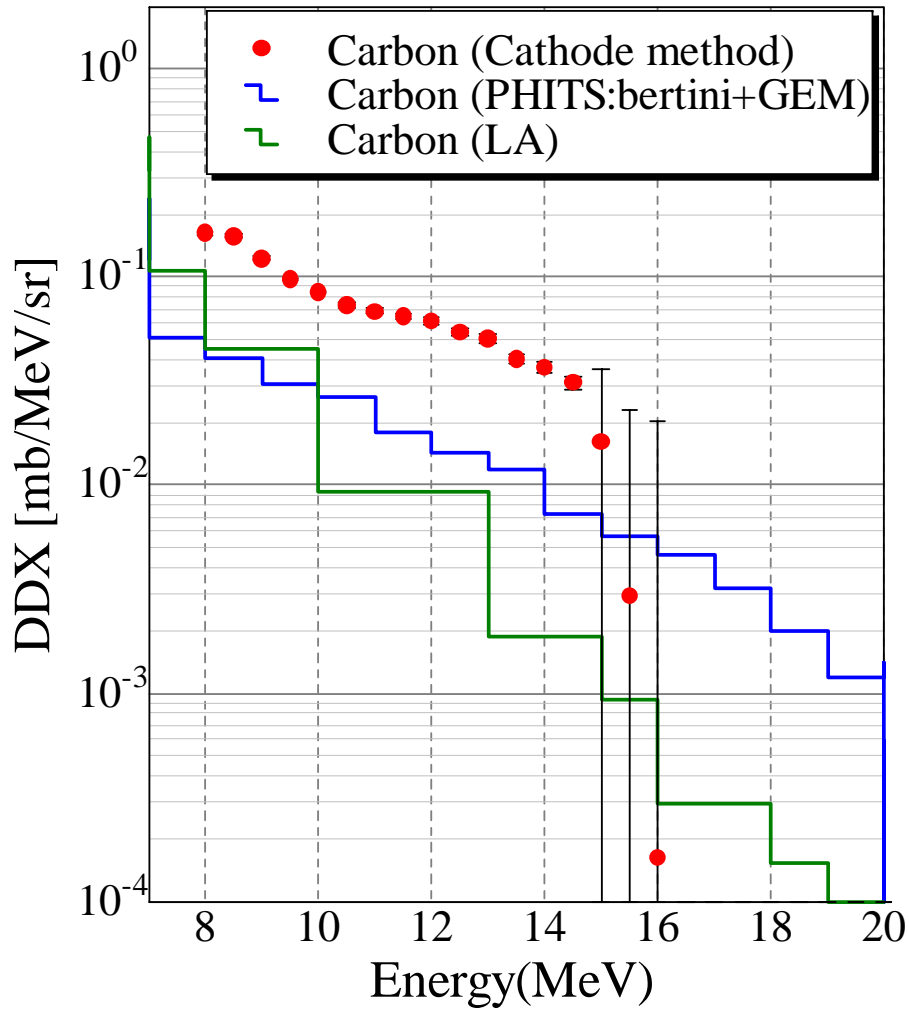
[2] Neutron activation $^{14}\text{N}(n,2n)^{13}\text{N}$



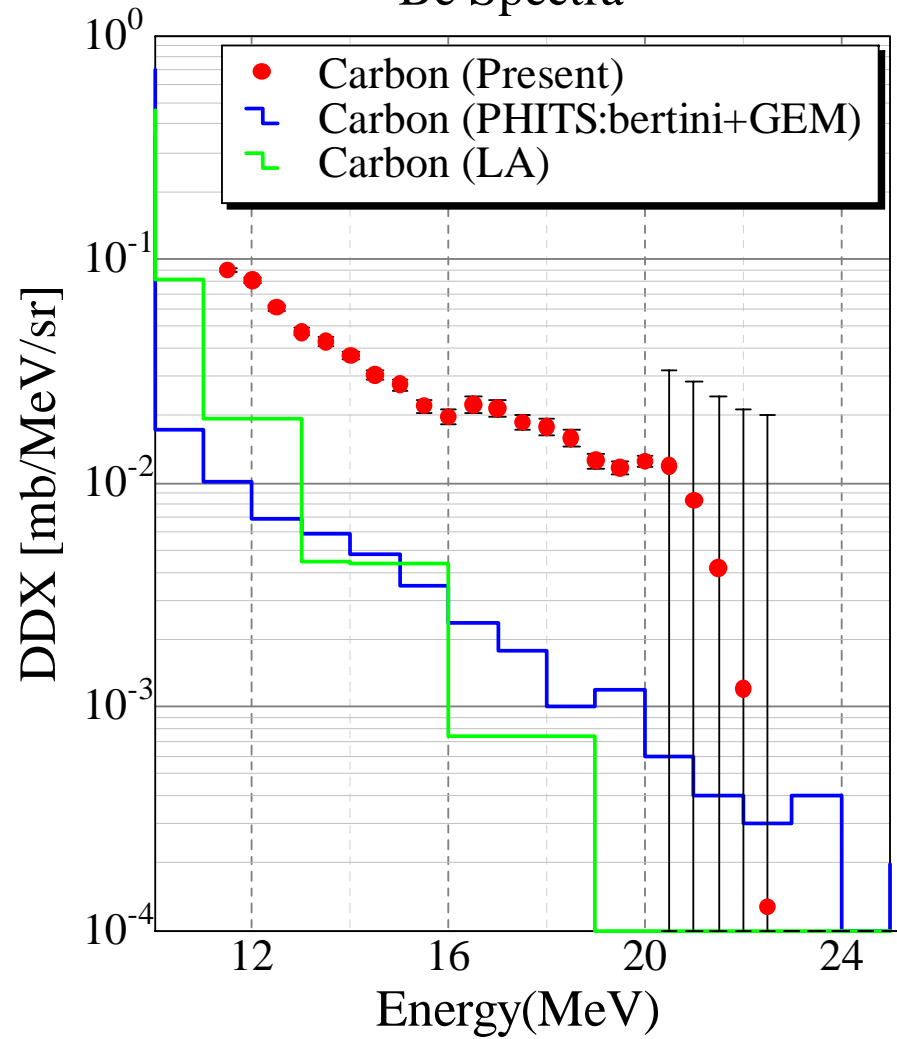
生成核種	反応	閾値 [MeV]	半減期	γ 線エネルギー [MeV]	放出率
^{13}N	(n,2n)	11.31	9.96 m	0.511	1.9962

[3] Fragment spectra; p+C ($E_p=70$ MeV), Bragg Curve Spectrometer

Li Spectra

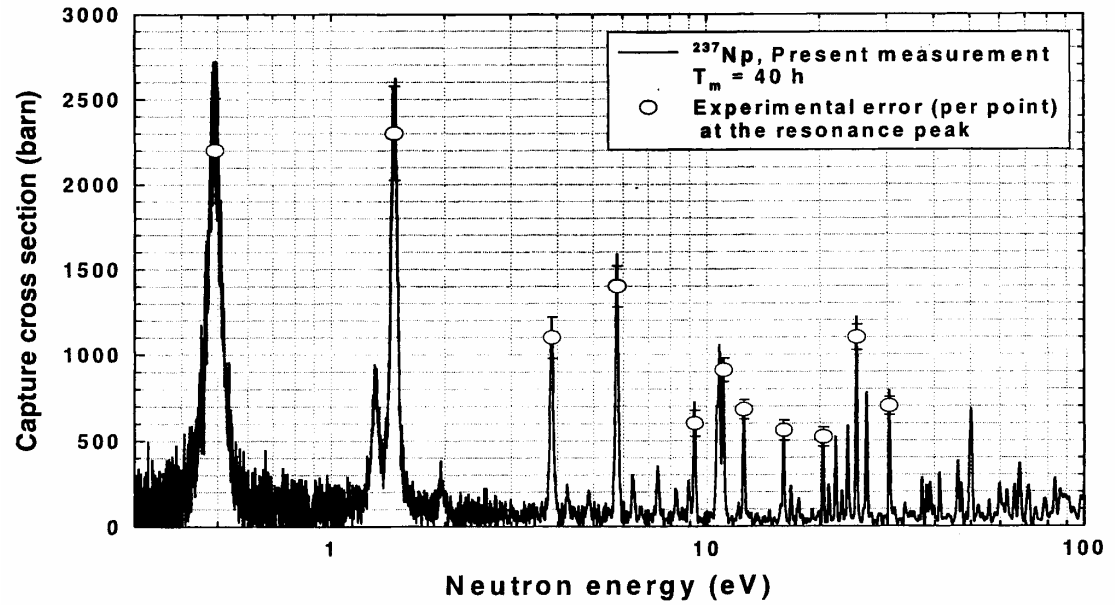


Be Spectra

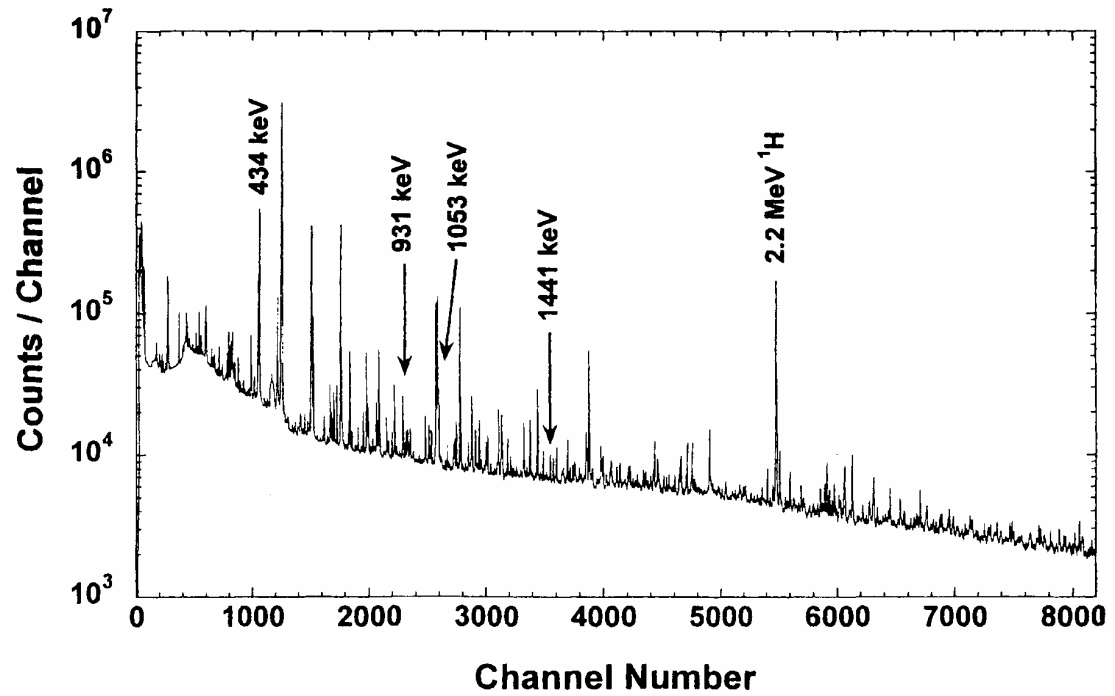


[4] JNC

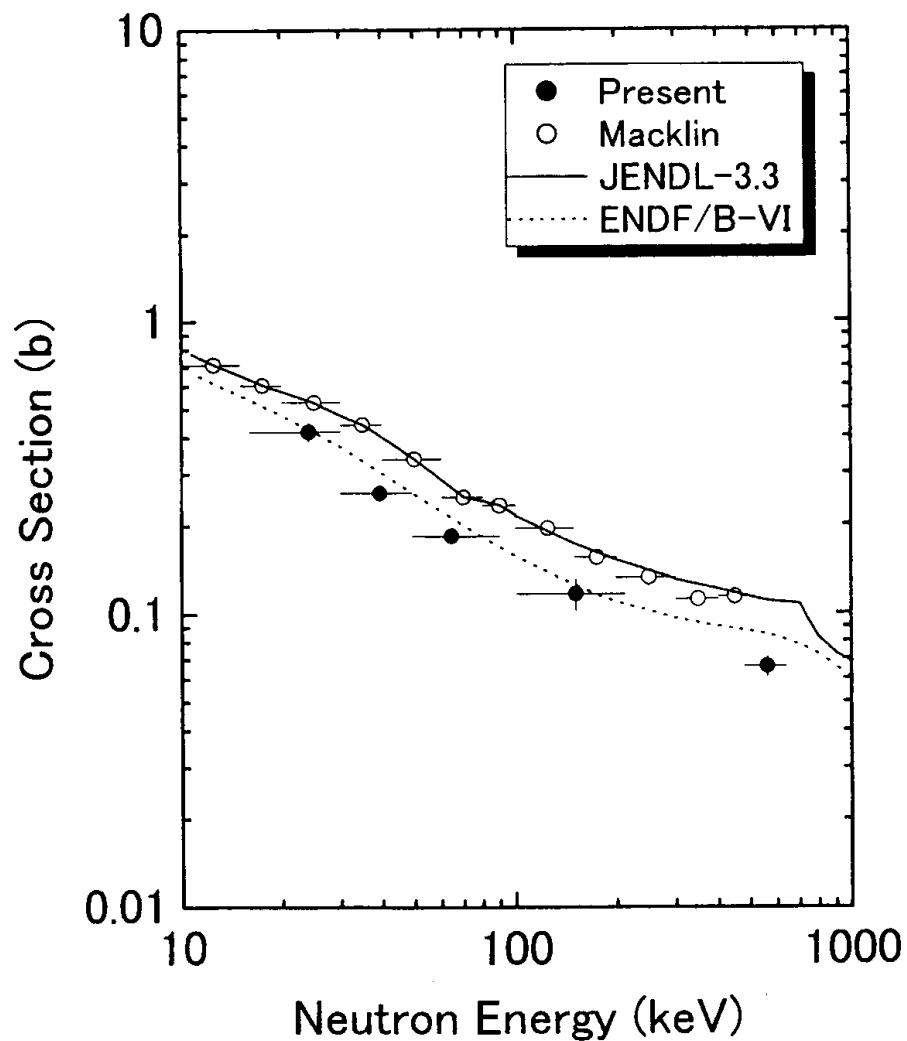
$^{237}\text{Np}(n, \gamma)$
cross-section



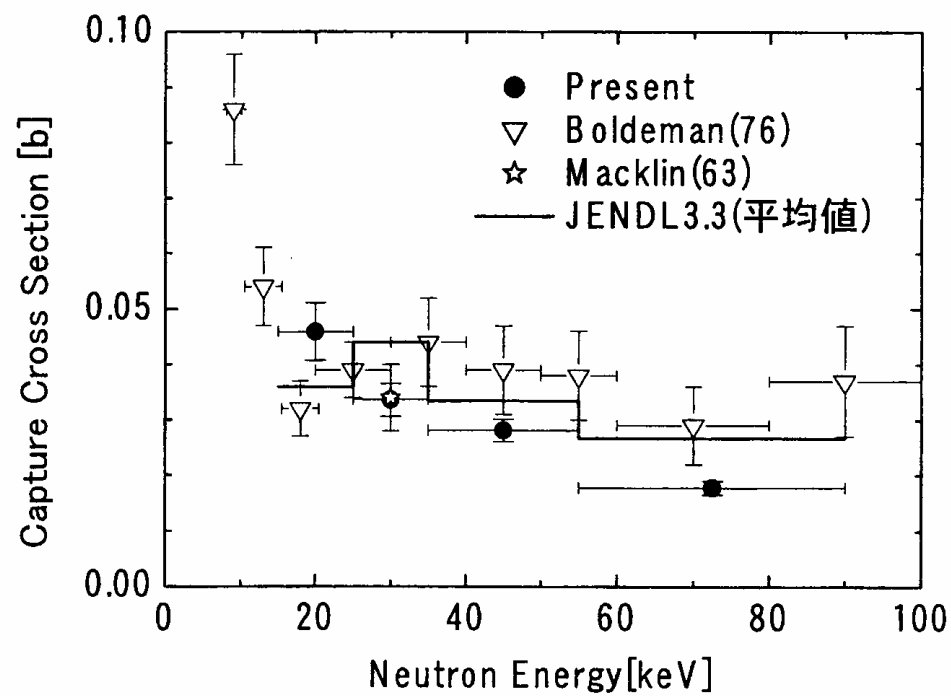
$\text{Pd}(n, \gamma)$
spectrum



[5] TIT $^{129}\text{I}(n, \gamma)$



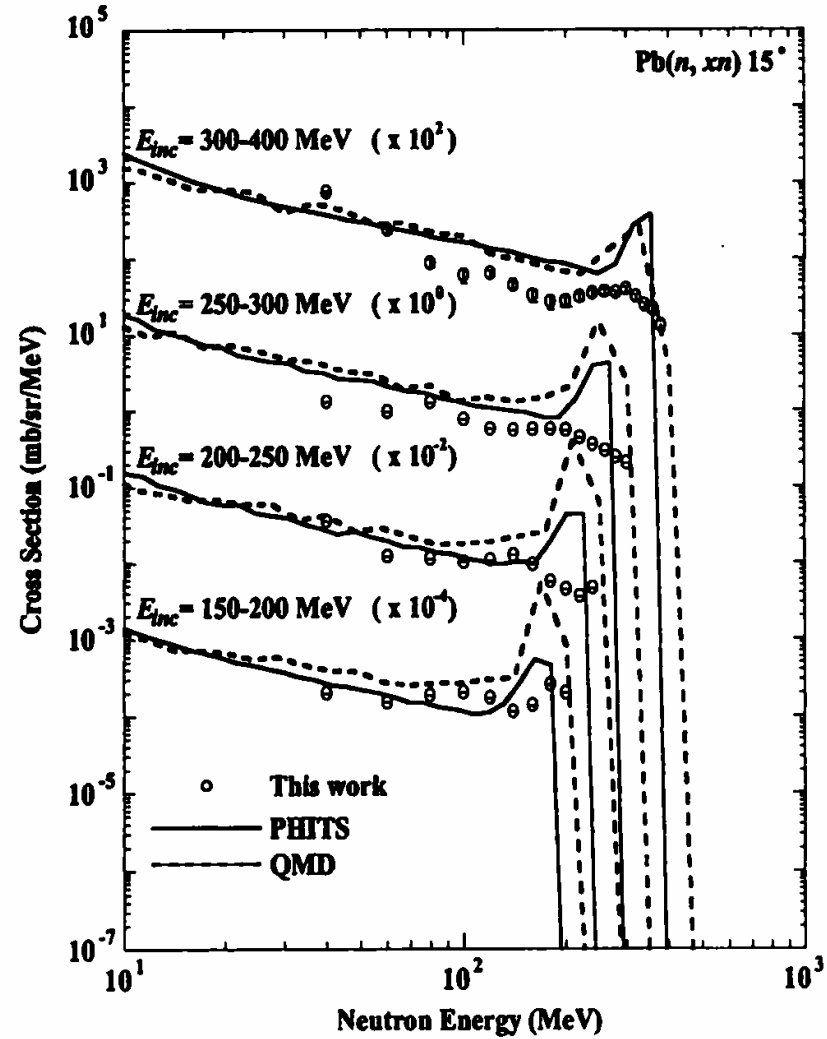
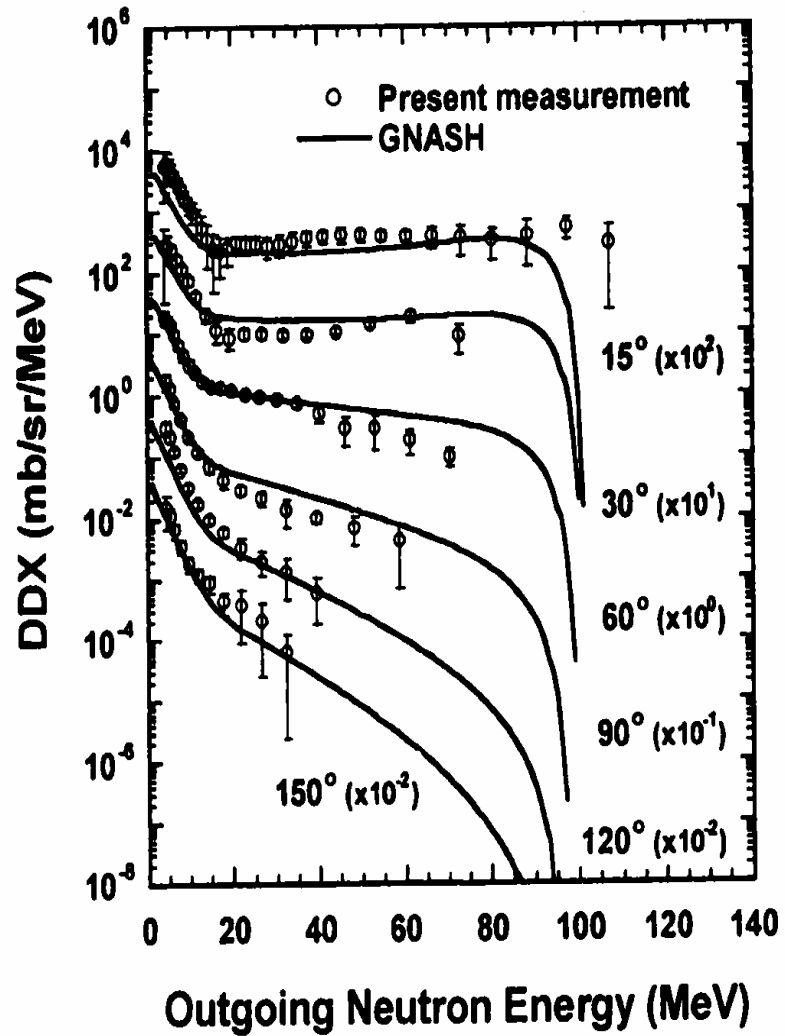
$^{92}\text{Zr}(n, \gamma)$



[6] Kyushu-U, (n,n'x) DDX @ 90- 400 MeV

En~ 90-110 MeV

En=150 – 400 MeV



2. Project Research on MA Nuclear Data for Advanced Nuclear Reactors

*Under MEXT (Ministry of Education, Culture, Sports, Sci. & Technol)

1. Collaboration between JAERI, JNC, Universities
(TIT, Kyoto, Tohoku, Nagoya, Hokkaido)

Lead by M. Igashira (TIT)

2. Research:

- 1) (n, γ) cross sections of MA isotopes using 4π γ - spectrometer
 - Development of the detector
 - Development of the experimental techniques
 - Ge ball with Anti-Compton suppression,
 - Flash ADC fast data acquisition system
- 2) Sample preparation techniques for the experiments
- 3) Fission cross sections and fission-related parameters
- 4) Development of Nuclear Data Utilization System