



# EFNUDAT 1<sup>st</sup> YEAR workshop

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## First year activity report in EFNUDAT (Target database) IKI

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# Content

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- JRA-3 target database from EFNUDAT partners
  - Primary and Minor actinide targets
  - Secondary targets
  - Requests
  - Suggestion for future development
- Installation of EASY-2003 inventory code as development tool for target designs

# History of the target database

- First form of the database was presented at the Kick-off meeting in Karlsruhe
  - The first version was meant to be complete inventory including the follow up of the history of the existing targets
  - After the presentation it become clear that much simpler version should be made
  - No further discussion happened on the topic
- A new much simpler version was designed
  - A skeleton of the simple data structure were circulated by e-mail among the partners
  - All partners accepted the format and gradually sent the data

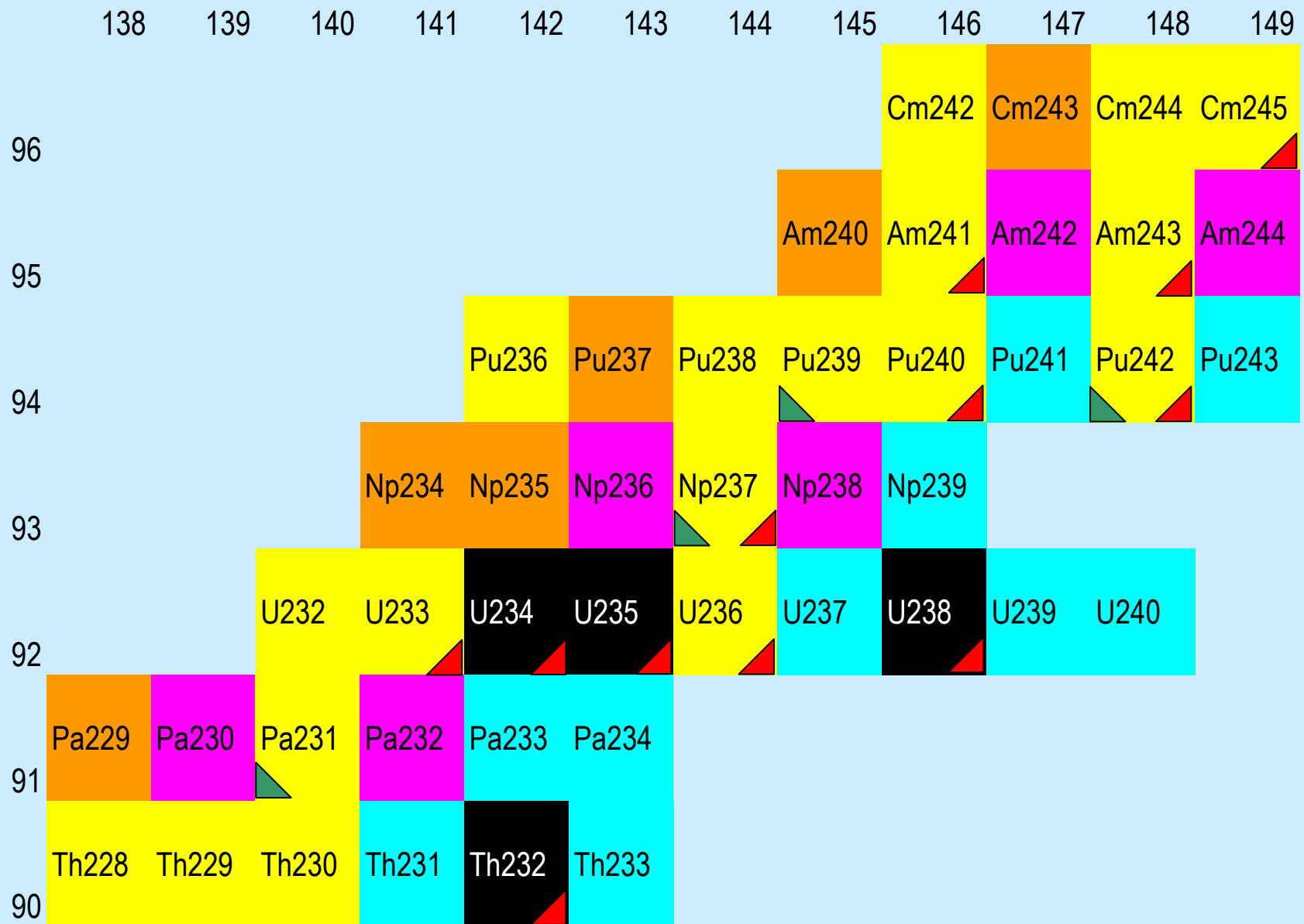
# Structure and content of the database

- The data are stored in an MS EXCEL file in four worksheets: Primary targets, Secondary targets, Target requests, I3 partners
- Primary targets example

| Isotope | Information on target         | Contact person | Address                | e-mail             | date of information |
|---------|-------------------------------|----------------|------------------------|--------------------|---------------------|
| 232Th   | ThO2 (thorium dioxide) powder | Tamas Belgya   | Institute of Isotopes, | belgya@iki.kfki.hu | 22/05/2007          |

- Primary target sheet contains 39 entries from 5 partners
  - One partner (IRMM) decided not to declare items, but information can be obtained in each case separately
  - Total number of targets is more than 76

# Available actinide isotopes and requests



# Secondary isotopes

- Structure is similar to the primary
  - The list contains 83 records with various isotopes
  - Most of them are interesting for nuclear structure research
  - Some of them may be interesting as structural material of transmutation devices

# Further development of the database

- It would be interesting to see more requests which could facilitate searches for other sources
- Some sources ( ) outside of the partners could be identified, but again request list would help to propose joint research
- From IKI side, we tried to search for target sources in Hungary with not much success till now
- A suitable target for  $^{241}\text{Am}(n,\gamma)$  were found at the Univ. of Debrecen

# EASY-2003 for target design

- European Activation System (EASY) from NEA
  - Calculates inventory (using FISPACT-2003 inventory code) for fission reactors or neutron sources where materials are exposed to neutrons below 20 MeV
  - European Activation File (EAF) contains
    - Cross section data for neutron-induced reactions
    - Uncertainty data for neutron-induced reactions
    - Decay data
    - Fission yield data
    - Biological hazard data
    - Legal transport data
    - Clearance data
    - Charged particle ranges in materials
    - Emitted particle spectral data (from neutron-induced reactions)
    - Charged particle cross section data
    - Gamma absorption data

# EASY-2003 for target design

- FISPACT includes
  - Description of the neutron spectrum either using one of the built-in energy group structures (69, 100, 172, 175 and 315 groups) or user defined
  - FISPACT identifies a subset of all possible reactions and uses these in the description of pathways and in data library printout.
  - The recognized reactions are:  $(n,\gamma)$ ,  $(n,2n)$ ,  $(n,3n)$ ,  $(n,4n)$ ,  $(n,n')$ ,  $(n,p)$ ,  $(n,d)$ ,  $(n,t)$ ,  $(n,n't)$ ,  $(n,2p)$ ,  $(n,h)$ ,  $(n,\alpha)$ ,  $(n,p\alpha)$ ,  $(n,n'\alpha)$ ,  $(n,2n\alpha)$ ,  $(n,3n\alpha)$ ,  $(n,n'2\alpha)$ ,  $(n,2n2\alpha)$ ,  $(n,d2\alpha)$ ,  $(n,t2\alpha)$ ,  $(n,n't2\alpha)$ ,  $(n,2\alpha)$ ,  $(n,3\alpha)$ ,  $(n,n'3\alpha)$  and  $(n,f)$

Thank you for your attention !