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# Experimental Nuclear Data Activities at ANL

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# FY06 ANL Activities

- ❑ Measurements with **GammaSphere & FMA** at **ATLAS** – complement some of the ANL evaluation activities
  - ✓ **Basic low-energy nuclear physics** & non-energy applications – **astrophysics** & detector efficiency standards
  - ✓ **Energy related applications**, e.g. isomers, spectroscopy of FP & minor actinides
- ❑ Properties of Nuclear **K-Isomers** in the **A~180** and **250** mass regions
  - ✓ completed studies of  **$^{174}\text{Lu}$** ; data analysis on  **$^{185,187}\text{Re}$**  is continuing; new results on  **$^{246,248}\text{Pu}$**
  - ✓ partial results on  **$^{174}\text{Lu}$** ,  **$^{170,172}\text{Er}$** ,  **$^{250,254}\text{No}$**  have been published

# FY06 ANL Activities – cont.

□ Decay Spectroscopy of **Actinide Nuclei** – part of the ANL commitment to the **IAEA-CRP** on “*Updated Decay Data Library for Actinides*”

✓  $\alpha$ –,  $\beta$ – and  $\gamma$ –ray decay studies (singles and coincidences) of  $^{233}\text{Pa}$ ,  $^{237}\text{Np}$ ,  $^{240}\text{Pu}$ ,  $^{242\text{m}}\text{Am}$ ,  $^{243,244,245,246}\text{Cm}$  &  $^{249,250}\text{Cf}$  using unique mass separated sources

✓ results on  $^{240}\text{Pu}$ ,  $^{244}\text{Cm}$ ,  $^{246}\text{Cm}$  &  $^{250}\text{Cf}$  have been published

□ Studies of  $^{186\text{m}}\text{Re}$  of relevance to **nuclear astrophysics** – under the auspices of the **USNDP ND for Astrophysics Task Force**

✓ the **experimental part** is almost complete – detailed structure of levels above the  $8^+$  isomer ( $T_{1/2} \sim 10^5$  y) is revealed; initiated studies of the **impact of new data on the isomer production (and destruction) cross-sections (TALYS & EMPIRE)** - new cross-section measurements are envisioned in FY07

# FY06 ANL Activities – cont.

- ❑ Studies at the accelerator driven sub-critical facility **YALINA**
  - ✓ two experimental campaigns in FY06 – reactivity studies for various configurations using different experimental methods – Pulsed Neutron Source, Source Jerk and Feynman- $\alpha$  - inter-comparison of these methods – transmutation reaction rates on **MA & FP** samples (will follow soon)
- ❑ Detailed analytical work using **ERANOS, MCNP, MCNPX & MONK** codes is in progress
  - ✓ what may be of interest to the CSEWG community - **validation of ND models & libraries** – using all major libraries **ENDF/B-VI, JEFF3.1 and JENDL3.3** – some differences between these libraries have already been observed

**ANL:** Y. Gohar, G. Aliberti, F.G. Kondev, D. Naberezniev & A. Talamo; **JIPNR:** A. Kiyavitskaja, I. Serafimovich, V. Burnos & Y. Fokov; **EUROTRANS**

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