

Progress Report on Nuclear Data Research in Argentina

to be presented at the 33 Meeting of the International Nuclear Data Committee (INDC)
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Bellow there is a list of the activities that have been carried out in Argentina related to nuclear data developments:

Activities related to thermal scattering

The nuclear data group was dissolved in 2019, some activities are still carried out by some of the former members working in collaboration with people from other groups

- Participation in ND 2019: International Conference on Nuclear Data for Science and Technology held in Beijing, China on 19-24 May 2019. We contributed with 2 publications:
 - *Validated scattering kernels for triphenylmethane at cryogenic temperatures*
F. Cantargi, J. Dawidowski¹, C. Helman, J.I. Márquez Damian, J.R. Granada, G. Romanelli, G. Cuello, G. Skoro and M. Krzystyniak
EPJ Web of Conferences 239, 14002 (2020)
<https://doi.org/10.1051/epjconf/202023914002>
 - *Experimental validation of the temperature behavior of the ENDF/B-VIII.0 thermal scattering kernel for light water*
J.I. Márquez Damian, J. Dawidowski¹, J.R. Granada, F. Cantargi, G. Romanelli, G. Cuello, G. Skoro, M. Krzystyniak and D. Roubtsov
EPJ Web of Conferences 239, 14001 (2020)
<https://doi.org/10.1051/epjconf/202023914001>
- Participation in the WPEC-SG48 meeting on Advances in Thermal Scattering Law Analysis held via Zoom on May 13, 2020
- Participation in the WPEC-SG48 meeting on Advances in Thermal Scattering Law Analysis held via Zoom on May 12, 2021
- Other Publications:

CIELO Collaboration Summary Results: International Evaluation of Neutron Reactions on Uranium, Plutonium, Iron, Oxygen and Hydrogen.

M.B. Chadwick, M. B., et al.
Nuclear Data Sheets, 148, 149-213 (2018)
<https://doi.org/10.1016/j.nds.2018.02.003>

Determination of the scattering cross section of calcium using the VESUVIO spectrometer

L.A. Rodríguez Palomino, J. Dawidowski, C. Helman, J.I. Márquez Damián, G. Romanelli, M. Krzystyniak, S. Rudić, G.J. Cuello, Nuclear Inst. and Methods in Physics Research, A 927 (2019) 443–450 (EXFOR entry 23531)

The joint evaluated fission and fusion nuclear data library, JEFF-3.3

J. M. Plompen et al
Eur. Phys. J. A (2020) 56: 181
<https://doi.org/10.1140/epja/s10050-020-00141-9>

Measurement of neutron total cross sections at the VESUVIO spectrometer

J. I. Robledo, J. Dawidowski, J. I. Márquez Damián, G. Škoro, C. Bovo, G. Romanelli, Nuclear Inst. and Methods in Physics Research, A 971 (2020) 164096. (EXFOR entry 23721)
<https://doi.org/10.1016/j.nima.2020.164096>

Determination of effective temperatures of hydrogenated and deuterated alcohols using the VESUVIO spectrometer

J. Dawidowski, L.A. Rodríguez Palomino, G. Romanelli, G.J. Cuello, J.I. Márquez Damián, J.I. Robledo, M. Krzystyniak, Nuclear Inst. and Methods in Physics Research, A 989 (2021) 164948,
<https://doi.org/10.1016/j.nima.2020.164948>

Activities related to heavy ions research

The Heavy Ion Group at the TANDAR (TANDem of ARgentina) Laboratory is involved with the experimental study of nuclear reaction mechanisms and in applied research, such as radiation damage, RBS, PIXE and AMS. The basic research is focused on scattering, transfer, breakup and fusion reactions of stable weakly bound projectiles such as ^2H , $^6,7\text{Li}$, ^9Be and ^{10}B . The detection techniques involve silicon detectors arrays for angular distributions, multiple-DE telescopes for particle identification, double-sided silicon strip detectors for exclusive time-coincidence measurements, and offline detection of delayed g-rays. Some recent publications are:

- Investigation of the fusion process for $^{10}\text{B} + ^{197}\text{Au}$ at near-barrier energies
M. Aversa, *et al.*, *Phys. Rev. C*101, 064601 (2020).
EXFOR entries: D0979002 - D0979011
- *Investigation of the reaction mechanisms for $^{10}\text{B} + ^{197}\text{Au}$ at near-barrier energies*

L.R. Gasques *et al.*, *Phys. Rev. C* **101**, 044604 (2020)
EXFOR entries: D0981002 - D0981004

- *Energy dependence of the optical potential of the weakly bound ^9Be projectile on the ^{197}Au target*
F. Gollan *et al.* *Nuclear Physics A* **1000**, 121789 (2020).
EXFOR entries: D0982002, D0982003.
- *Breakup threshold anomaly in the elastic scattering of the $^9\text{Be} + ^{80}\text{Se}$ system*
F. Gollan *et al.*, *Nuclear Physics A* **979**, 87–101 (2018).
EXFOR entry: D0914002
- *Compilation and Evaluation of Beta-Delayed Neutron Emission Probabilities and Half-Lives for $Z > 28$ Precursors*
J. Liang *et al.*, *Nuclear Data Sheets*, **168**, (2020), p 1-116
<https://doi.org/10.1016/j.nds.2020.09.001>

Currently, the manuscript *Neutron transfer, complete and incomplete fusion for the $^9\text{Be} + ^{197}\text{Au}$ system* by F. Gollan *et al.* is being reviewed at *Physical Review C*. Other studies, such as the analysis of the elastic scattering, neutron stripping, neutron pickup, breakup and fusion-evaporation of the $^2\text{H} + ^{197}\text{Au}$ system is currently being analyzed.

Activities related to radioisotope production

The basic radiochemistry group is linked to developments associated to the radioisotopes production. They are users of nuclear reaction data for both neutrons and protons, especially cross sections and excitation functions, but also half-lives, emission types, and even isotopic abundances.