CM on Evaluation of Photon Strength Functions

Wednesday 12 November 2025 - Friday 14 November 2025

IAEA, Vienna, Austria

Book of Abstracts

Contents

Presentations III / 1

Update on the compilation and assessment of experimental photon strength function data

Authors: Kgashane Malatji[1]; Thibault Laplace[1]; Mathis Wiedeking[2]

[1] *University of California Berkeley, Berkeley, CA, USA*

[2] *Lawrence Berkeley National Laboratory, Berkeley, CA, USA*

Corresponding Authors: mwiedeking@lbl.gov, klmalatji@lbl.gov, lapthi@berkeley.edu

I will provide an update on the current photon strength function experimental data compilation and assessment. New data were added for the Oslo Methods, the Ratio and Shape Method, and Nuclear Resonance Fluorescence. Further, a modified approach on how to capture asymmetric and/or total uncertainties has been developed and the file labelling system has been streamlined.

In this presentation I will discuss the assignment of quality indicators, the challenges encountered, and the proposed solutions for the overall maintenance of the database.

Supported by the U.S. Department of Energy, Office of Science, Office of Nuclear Physics under Contracts No. DE-AC02-05CH11231 and by the US Nuclear Data Program.

Presentations I / 2

Photon strength functions in light nuclei from forward-angle proton scattering

Author: Peter von Neumann-Cosel[1]

[1] *Institut für Kernphysik, Technische Universität Darmstadt*

Corresponding Author: vnc@ikp.tu-darmstadt.de

Inelastic proton scattering at several hundred MeV and extreme forward angles has been established as a versatile tool to study photon strength functions in heavy nuclei from low to high excitation energies. I will report on recent extensions of the method to lighter nuclei. While the approach becomes more model-dependent because of the less favorable ratio of Coulomb to nuclear cross sections, such an analysis seems valuable in view of the notoriously scarce and often conflicting total photoabsorption data in light nuclei. Results for ^{58}Ni, ^{40,48}Ca and a series of sd-shell nuclei will be discussed. The latter are confronted with large scale shell-model calculations and data-driven artificial neural network predictions.

Presentations I / 3

An update on multi-step cascade spectra results

Author: Milan Krtička[1]

[1] *Charles University, Prague*

Corresponding Author: krticka@ipnp.troja.mff.cuni.cz

Info about recently published data from multi-step gamma cascade spectra will be provided.

Presentations II / 4

Systematics of characteristics of pygmy dipole resonances in middle and heavy atomic nuclei with neutron excess

Author: Volodymyr Plujko[1]

Co-author: Oleksandr Gorbachenko [1]

[1] *Taras Shevchenko National University of Kyiv, Kyiv, Ukraine*

Corresponding Authors: oleksandr.gorbachenko@gmail.com, plujko@gmail.com

The systematics of energies and contribution to the energy-weighted sum rule of dipole gamma transitions of pygmy dipole resonance (PDR) in middle and heavy nuclei with an excess of neutrons are considered. To describe the energy of the PDR, a macroscopic model of Isacker-Nagarajan-Warner [1] was applied with a relative displacement of the densities of the protons of the crust and surface neutrons. Modified expressions for calculating energy with the number of near-surface neutrons in proportion to the thickness of neutron skin according to the Pethick- Ravenhall approach [2] are presented. Analytical expressions for PDR fraction to the energy weighted sum rule for electric dipole transitions (E1 EWSR) are compared with microscopic calculations and experimental data. Simplified expressions for calculating the PDR contributions in E1 EWSR are presented.
[1] P. Van Isacker, M.A. Nagarajan, D.D. Warner, PRC 45(1), R13(1992).
[2] C.J. Pethick, D.G. Ravenhall, NPA, 606(1-2), 173–182(1996).

Presentations III / 5

Comparison of theoretical calculations to Oslo-type experimental data

Authors: Kgashane Malatji[1]; Mathis Wiedeking[None]; Thibault Laplace[1]

[1] *University of California, Berkeley*

Corresponding Authors: lapthi@berkeley.edu, mwiedeking@lbl.gov, klmalatji@lbl.gov

I will present comparisons between experimental data obtained using the Oslo method and the theoretical calculations available on the database webpage (SMLO and D1M-QRPA). Oslo data were assigned quality indicators based on the quality of the uncertainty analysis performed as well as the availability of external nuclear data used for normalization. Outliers were identified and correlations as function of the nuclear mass and quadrupole deformation will be presented.

Supported by the U.S. Department of Energy, Office of Science, Office of Nuclear Physics under Contracts No. DE-AC02-05CH11231 and by the US Nuclear Data Program.

Presentations III / 6

Updates from OCL

Author: Vetle Ingeberg[1]

[1] *Department of Physics, University of Oslo*

Corresponding Author: vetlewi@fys.uio.no

I will give a presentation of the most recent results from the Oslo group and the current ongoing projects.

Presentations I / **7**

Nuclear Data Section PSF - Neutron Capture 2025

Author: Jiri Kopecky[1]

[1] *JUKO Research*

Corresponding Author: juko@planet.nl