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Development of a Photon Strength Function Database Interface

We have developed a specialized web application with the purpose of managing, querying, and visualizing Photon Strength Function (PSF) data. This data is compiled in a well-defined format as an outcome of an IAEA Coordinated Research Project [1]. This web application represents a significant advancement in accessibility and interaction with the data over existing platforms, particularly improving upon the capabilities of the prior resource noted in Ref [2].

Central to this application is the database structure, crucial for efficient data management and retrieval. Built using the Django framework, the web application's user interface is designed to present queried data and search results in an accessible format. It works seamlessly with the backend to fetch and display data (based on the data query from the user), detailing basic nuclear properties such as atomic number (Z) and mass number (A), multipolarity, energy range, and experimental method employed to produce the data. Additionally, the application offers functionalities for searching and sorting data by author names or publication years, facilitating a more refined navigation through the extensive PSF data repository. This is especially beneficial for tracking specific contributions or examining the evolution of PSF data over time.

A noteworthy feature is the dynamic data visualisation tool, which utilises Plotly to create interactive graphs displaying strength functions and other pertinent data points, thus enhancing the intelligibility of different datasets. Moreover, the platform features a comprehensive data processing pipeline. In the backend, this pipeline extracts, transforms, and loads information from data files and README files into the system, safeguarding data integrity and accessibility.

In this presentation, I will discuss and demonstrate the web application, which marks a substantial advancement in the management and dissemination of PSF data.

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References:
[1] Goriely et al., Eur. Phys. J. A (2019) 55:172
[2] International Atomic Energy Agency. "Photon Strength Functions Database." IAEA Nuclear Data Services. https://www-nds.iaea.org/PSFdatabase/

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