

# Modernizing Experimental Nuclear Data Access: The IAEA Nuclear Reaction Data Explorer

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The use of experimental nuclear reaction data in the EXFOR format~\cite{EXFORFormatsManual2015} and evaluated nuclear data in the ENDF-6 format~\cite{ENDF6FormatsManual2018} continues to be hindered by challenges in preprocessing and integration with modern computational workflows. These limitations pose significant barriers to applying advanced data analysis, modeling, and machine learning techniques in nuclear data research.

To address these challenges and modernize access to such data formats, the IAEA Nuclear Data Section has developed the IAEA Nuclear Reaction Data Explorer, a comprehensive platform designed to support easy access to nuclear reaction data. Since its release in 2021, the system underwent a major update in March 2024, featuring:

- Integration of EXFOR data via the open-source EXFOR Parser~\cite{Okumura2024, EXFORParser}
- A redesigned EXFOR entry interface for enhanced user interaction
- Updated ENDF-6 datasets sourced from ENDFTABLES
- A new suite of RESTful APIs to enable programmatic access and workflow automation~\cite{dataexplorer}

These developments align with the FAIR (Findable, Accessible, Interoperable, Reusable) data principles and the guidelines established in SG50~\cite{SG50-2023}, which emphasize open data and tools for community-driven science. The EXFOR Parser enables conversions of wixed-width formatted EXFOR data into JSON, which is further transformed into tabulated  $(x, y, dx, dy)$  stored as ASCII text files and in a SQL database. This process ensures compatibility with modern scientific computing environments.

The renewed DataExplorer platform offers interactive web-based visualization and supports reproducible data access through its APIs. It provides a foundational step toward interdisciplinary use of nuclear data across physics, data science and applications.

This presentation will outline the features and system ecosystem. We will also discuss ongoing and planned developments to further modernize and expand the system's capabilities for the global nuclear data community including FENDL community.

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**Session Classification:** Information Technology, Tools, Codes