

Developing a Web Service for EXFOR Using RESTful API and JSON Schema

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The Experimental Nuclear Reaction Database (EXFOR) is a collection of numerical data compiled by an international collaboration within the Nuclear Reaction Data Centre (NRDC). Despite the data being digitized and widely used, the 80-column fixed width format with line numbers in every line, which originates from punch card legacy, is still in use. This format restricts users from using EXFOR data directly with plotting packages or modern AI/ML tools, such as developing outlier detection, substantially undermining the applications of modern techniques.

As an initial attempt, we are developing the EXFOR parser to convert EXFOR data to JSON and providing data via REST APIs and a new interface. Our developments incorporate the preservation of the EXFOR master files, a Python parser to convert EXFOR and EXFOR dictionary to JSON, a RIPL3 discrete level parser, a decay data parser, a FLASK-based RESTful API, and a Dataexplorer[1] interface developed in the Dash/Plotly framework. The Git service, Github repository of IAEA-NDS[2], tracks modifications, updates, and deletions of EXFOR master files, converted JSON files, parser and plotting module programs.

In this presentation, we will provide an overview and examples of our developments, which might be useful for storing EXFOR data in GNDS format or using EXFOR data in modern mechanisms.

[1] <https://nds.iaea.org/dataexplorer/>

[2] <https://github.com/IAEA-NDS/>

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