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Development of a New Web Services and RESTful APIs for for Experimental Nuclear Reaction Database (EXFOR)/原子核反応実験データベース（EXFOR）の新 Web サービスと RESTful API の開発

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Experimental nuclear reaction data are essential for understanding nuclear reaction phenomena, developing nuclear theories and models, and evaluating data for nuclear data libraries. Efficient data mining from the Experimental Nuclear Reaction Database (EXFOR)[1] has a potential for utilization of modern computational analysis techniques to find trends, shortcomings, and hidden patterns in the database, which in turn helps improve our knowledge of nuclear physics. The IAEA Nuclear Data Section (NDS) is entrusted with the responsibility of maintaining and facilitating user-friendly access to this data. To fulfill this mandate, the NDS has developed several services, such as the EXFOR web retrieval system, however, the rapid advances of compute infrastructure and the increasing demand to process nuclear data at scale in the context of ML and AI applications enforces us to adhere the FAIR (Findable, Accessible, Interoperable, Reusable) principles for the service implementation.
To facilitate more advanced method in the nuclear data field, we have developed two EXFOR parsing computer programs (EXFOR Parser) to convert the data in the EXFOR format into the widely adopted JSON format. The converted JSON data are used for further processing to extract individual physical observables and generate tabulated data (x, y, dx, dy) where all units of measurement are standardized. Furthermore, we have developed REST APIs and an open web system for easy access and quick visualizations of these converted datasets.

References

[1] N. Otuka, E. Dupont, V. Semkova, B. Pritychenko, A. Blokhin, M. Aikawa, S. Babykina, M. Bossant, G. Chen, S. Dunaeva et al., Nuclear Data Sheets 120, 272 (2014)
[2] V. Zerkin, B. Pritychenko, Nuclear Instruments and Methods in Physics Research Sec- tion A: Accelerators, Spectrometers, Detectors and Associated Equipment 888, 31 (2018)
[3] M.D. Wilkinson, M. Dumontier, I.J. Aalbersberg, G. Appleton, M. Axton, A. Baak, N. Blomberg, J.W. Boiten, L.B. da Silva Santos, P.E. Bourne et al., Scientific Data 3, 160018 (2016)

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