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From ENSDF to NuDat: Search, Filter and Visualize Nuclear Data

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The National Nuclear Data Center (NNDC) at Brookhaven National Laboratory (BNL) has developed NuDat, a powerful web application enabling users to explore comprehensive databases of nuclear structure, nuclear decay, and neutron-induced nuclear reaction data. As the primary interface for querying, visualizing, and disseminating data from the Evaluated Nuclear Structure Data File (ENSDF), NuDat provides access to authoritative evaluated nuclear structure and decay values derived from all published experimental data. Annually, NuDat supports over 7 million retrievals, serving a diverse audience in research, education, and various applied fields.

The technology behind NuDat, initially developed more than 15 years ago, has since been surpassed by significant advancements in web capabilities. The NNDC has modernized NuDat to deliver an enriched user experience that fosters both discovery and in-depth exploration of nuclear data properties. The updated NuDat incorporates HTML Canvas to create a dynamic and interactive chart of nuclides, allowing users to navigate a database of over 3,300 nuclides with fluid pan and zoom gestures. Additional features include customizable filters and data export options, which enhance usability and flexibility.

Further extending NuDat's capabilities, the NNDC is developing a 3D version of the application using Three.js. This 3D interface will enable users to explore the chart of nuclides in a fully immersive environment, complete with adjustable visualization settings, thereby offering a new dimension to the understanding of nuclear data. These advancements in NuDat underscore NNDC's commitment to providing cutting-edge tools for the nuclear science community and beyond.

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