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Design automation of pre-separator wedges for FRIB advanced rare isotope separator

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At the Facility for Rare Isotope Beams (FRIB) unique pre-separator wedges are required for each experiment. As the number of experiments and wedges needed increases every year, reduction in design time and increase in accuracy is critical (FY23 utilized 40 unique wedges, FY24 approx. 60 are planned, and eventually 100 annually).

Design automation is achieved by DriveWorksXpress, which reduced design/drafting time by 60%. A form was created with parameters (inputs) listed for each component of the wedge assembly (e.g., wedge height, wedge on axis thickness, wedge angle, etc.). The dimensions and file properties of each component are then able to reference the input values for each parameter from the form and automatically adjust the model and assembly accordingly. Automation on drawing drafting is achieved at the same time.

The reduction in design time resulted in completing the design task more efficiently. A reduction in design error and human error was also observed, reducing manufacturing down time and effort required during the release process. These benefits have streamlined the mechanical design process for the pre-separator wedges.

Footnotes

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Paper preparation format

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