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Developing nested auto-differentiation tracking code for beam dynamics optimization

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An innovative particle tracking code is in development using the Julia programming language, utilizing the power of auto-differentiation (AD). With the aid of specifically designed truncated power series algebra (TPSA) methods and built-in Julia AD packages, this code enables automatic calculation of derivatives with respect to selected parameters of interest. This tracking code provides a flexible and powerful solution for accelerator physicists applicable across various research topics, especially for beam dynamics optimization works.

Footnotes

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North America

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