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# Multiphysics modeling of accelerators through code integration

*Monday, 20 May 2024 16:00 (2 hours)*

This work aims to improve the ability of particle accelerator researchers to develop high-performance accelerator cavity designs by creating an overall multiphysics framework that integrates and couples existing application codes. This framework will allow accelerator researchers to build multiphysics models that will optimize cavity design, improve understanding of whole-device performance, and reduce the development and fabrication costs of accelerator research. We utilize the open-source VizSchema data standard as an intermediate data structure interface layer to standardize interfaces between individual application codes. VizScema is extensively documented online, and plugins for VizSchema are available for popular visualization packages, including VisIt and ParaView. Currently, the work focuses on coupling the EM field solver COMSOL and the electron gun code MICHELLE to allow COMSOL field-solve results to be seamlessly used by MICHELLE for particle-solve. Later work will extend this integration to include other fields, particles, and thermodynamics simulation codes.

## Footnotes

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North America

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