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Development of a compact laser-free accelerator-driven X-ray source based on channeling radiation

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Channeling radiation produced from field-emitted electron bunches accelerated in a compact high-duty cycle accelerator could lead to the development of laser-free rugged X-ray sources [C. A. Brau, et al., *Synchrotron Radiation News*, 25, Issue 1 (2012)]. This type of source could have application in a variety of domains including in medical imaging and industry. In this paper we present our progress toward the design of such a compact accelerator including high-fidelity simulations of the electron source, its beam dynamics and the channeling radiation process.

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