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An Oil-Free Compact and Portable X-Pinch Radiation Source: Overview and Radiation Performance

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This work presents a novel, compact, and portable x-pinch radiation source developed and tested at Idaho State University. The salient features of our x-pinch radiation source are its simplicity, compactness, and portability: there is no oil, no water, and no SF6. It can be easily relocated to any place where a compact x-pinch radiation source is wanted. Despite its simplicity, it generates a very fast and bright radiation pulses comparable to other x-pinch drivers. Measurements indicate that 2- to 6-ns wide XRD signals were reproducibly formed in the 190-ns to 250-ns time window after the current start from 2x30-μm Mo x pinches. Source size measurements indicate that this radiation originates from a small, 12-μm in diameter dense plasma, known as a “hot spot”.

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