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Los Alamos National Laboratory Fast Kicker Upgrade 2022

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The Los Alamos Neutron Science Center's proton storage ring (PSR) extraction kicker systems consist of two thyatron switched blumlein modulators. The operating parameters of the PSR have changed over the years and the flattop voltage of the modulator outputs has become a limiting factor in the length of the beam pulse able to be extracted from the ring. The extraction voltage pulse travels upstream relative to the beam and thus needs to be longer than the beam pulse. A reanalysis of the voltage waveforms and the beam propagation times revealed that a longer pulse could reduce beam spill levels that have been seen during past run cycles. Reduced spill will allow operation at higher beam currents and thus increase the amount of beam current available for experimenters. We have upgraded the blumlein cables in both extraction kicker modulators with longer cables. We present test results of the modulator outputs and correlate their improvement with reduced beam losses at the PSR exit septum and improved beam delivery.

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Footnotes

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Yes

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