

# High-Voltage Pulsed Power Generator for Beam Injection Systems

*Sunday 25 August 2024 16:00 (2 hours)*

Beam injection systems in hadron colliders require kickers generating  $\pm 50$  kV peak voltages into a  $50\ \Omega$  impedance, with peak currents of 1000 A and sub-10 ns rise and fall times. This paper presents a novel high-voltage pulse power generator utilizing a distributed pulser architecture. It combines gallium nitride (GaN) transistors in a Marx topology with an inductive adder, achieving nanosecond-scale switching speeds and high-power efficiency. Compared to other solutions such as based on MOSFETs or fast ionization dynistors, our development offers superior peak and average power performance, reduced system complexity, and enhanced reliability, marking a significant step forward in high-voltage pulse generation for accelerator applications.

## Footnotes

## Funding Agency

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