

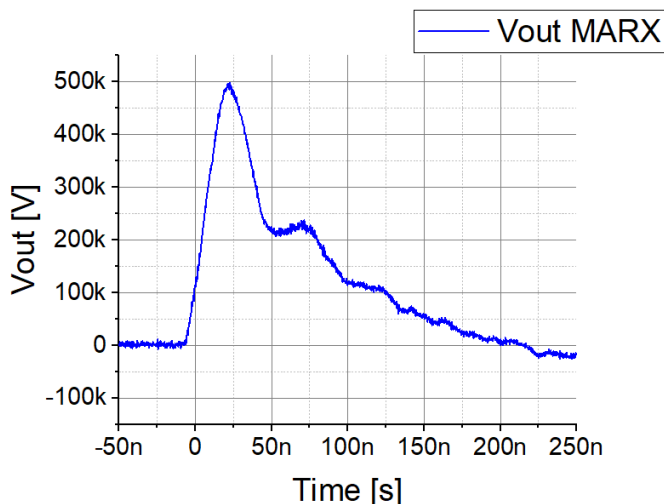


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## Design and test of a high PRF 0.5 MV Marx generator to drive PFLs

### Abstract

During the last decades, new developments in the pulsed power technology for application to food processing, water treatment, medical domain and defense industry were accompanied with an increased research interest worldwide. My work consists in the design, development, and test of a 13 stage, 0.5 MV, high PRF Marx generator used to feed monopolar and bipolar PFLs for applications to both military and bio-medical domains. The design phase was conducted by thorough analytical calculations and numerical simulations using the PSpice electronic circuit simulation software. The fast-switching process of the generator is based on spark gaps, operated under pressurized air, leading to generation of output voltage pulses with an amplitude approaching 0.5 MV and with a rise time of 25 ns. Each stage of the Marx is charged by a 50 kV – 160 mA DC charger through an inductor and a diode connected in series. The equivalent capacitance of each stage is approximately 3.9 nF, allowing the generation of 40 J pulses, with a PRF up to 50 Hz. The tests show a good agreement between the experimental data and the theoretical predictions.



*Marx output signal*



*Marx generator, experimental setup*