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Triggering of a High Pressure Air-filled High Voltage Spark Gap Switch Using Laser Induced Plasmas Resulting in Sub-nanosecond Jitter at Low Percentages of Self-Break*

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We demonstrate a high pressure, air-filled, spark gap switch with small gap geometries of 1.5 - 3.5 mm triggered using a laser induced plasma between the electrodes with laser energies as low as 500 uJ resulting in jitter from 350 ps to 2.2 ns when operated between 70% - 30% of self-break for voltages >100 kV. Switches of this design can be used for near-synchronous firing of 100's to 1000's of switches while maintaining low impedance and low inductance.

In this work, we will present our most recent results for our prototype switch in terms of gap geometry, DC hold-off voltage, operating pressure, switch run-time, laser energy, and jitter.

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Author: SIMPSON, Sean (Sandia National Laboratories)

Co-authors: DUMITRACHE, Ciprian (Colorado State University); Mr JOHNS, Owen (Sandia National Laboratories); Dr KIEFER, Mark (SANDIA NATIONAL LABORATORIES); LECKBEE, Josh (Sandia National Labs); NIELSEN, Dan (sandia national laboratories); Mr ROSE, Charles (Colorado State University); YALIN, Azer (Corlorado State University)

Presenter: SIMPSON, Sean (Sandia National Laboratories)

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