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A compact UHV-compatible high-voltage supply for a small dielectric laser accelerator

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High voltage sources are used in a variety of applications including X-ray tubes, electron microscopes and particle accelerators. One of the most common methods of high voltage generation is the Full-Wave Cockcroft-Walton voltage multiplier (FWCW), where each stage consists of three capacitors and four diodes. The aim of this work is to introduce a circuit design that provides a high voltage (60keV) with low ripple (<1V) and a small footprint, while being fully ultrahigh vacuum (UHV) compatible. By placing this HV generator inside the UHV, we can avoid bulky HV feedthrough and the isolation requirements. Such an in-vacuo unit could be used to operate an electron gun to provide a small sized self-contained electron source, which will be utilized for compact future dielectric laser accelerator experiments. Recent experimental results and simulations will be presented.

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