

Abstract Submitted  
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**A Low Voltage, High Current Dense Plasma Focus using an Impedance Transformer**<sup>1</sup> BRIAN BURES, MAHADEVAN KRISHNAN, KRISTI WILSON-ELLIOT, ROBERT MADDEN, FLORIAN BLOBNER, Alameda Applied Sciences Corp — The dense plasma focus is a high voltage, high current device. In principle, high voltage is unnecessary as the dense plasma focus (DPF) is a low impedance load. The impedance of the driver usually dominates the impedance of the circuit. An alternative approach is to use a step down transformer to increase the current and reduce the voltage at the load. Additional benefits of this approach are: reducing driver inductance to less than 5nH from a >30nH driver; reducing stored energy to achieve a large current; minimizing consumable switches; and reducing anode heating. A module capable of producing 33 kA with a quarter period of 350 ns was demonstrated using a 3:1 current step-up transformer. The source stored only 40 J and produced  $\sim 1E4$  n/pulse using deuterium gas, while using a single Thyatron switch. The new module is a 6:1 current step up transformer which is projected to produce 60-66kA with 50J stored. Key performance metrics for the DPF including peak current, energy stored, and neutron yield will be described.

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