

Abstract Submitted  
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**Optimization of a small scale reluctance linear solenoid accelerator** THOR BARRERA, ROBBY BEARD, California State University, Sacramento — Small scale accelerator technologies provide opportunities in innovative and efficient transportation systems. Accelerator technologies are ever decreasing in size and complexity. The goal of the research was to develop more efficient small scale accelerators by optimizing high current flow through the accelerating solenoid. To do this; low temperature liquid nitrogen cooling systems and Cockcroft-Walton voltage multiplier power supply systems were examined closely to maximize the magnetic field inside the solenoid. Additionally, ferromagnetic fluids were examined in conjunction with these technologies to investigate the possibility of controlled braking of an accelerated object. The experimentation provides a high quality laboratory experiment for undergraduates interested in accelerator physics. Additionally, it provides a useful demonstration apparatus for undergraduate students studying lower division electricity and magnetism courses. A demonstration of the current development on these technologies will be offered at the time of the lecture.

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