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Plasma Propulsion III

My project focuses on improving efficiency of the Pulsed Inductive Thruster. I theorized that pre-ionizing the fuel would allow for more of the energy of the magnetic field to go into accelerating the fuel. I improved upon last year's project by increasing the efficiency of the switching circuitry for my capacitor bank. I also reconfigured the capacitor bank for a higher voltage pulse. I improved my charging circuitry to allow for higher charging voltage and greater control over charging. I had a problem last year with my method for measuring thrust involving the signal level and sensitivity. This year I built a stand that used a lever to mechanically amplify the force and subsequently cut out electrical amplification of interference from the ionization source. Along with the mechanical amplification, I shielded all of the sensor signal routes with coax cable. I also purchased a higher quality oscilloscope to capture the sensor pulse better. I rebuilt the thruster prototype with a larger diameter coil to better match my capacitor bank. There was a coax feed through added for the signal from the sensor. After all of these improvements, I believe that I have achieved thrust. The plasma created can be seen moving away from the surface of the coil when the thruster is fired. A pulse from the sensor has also been recorded multiple times and observed many more times. This proves that it is indeed more efficient to pre-ionize the fuel, because without ionization there is no thrust at all.