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Influence of Capacitor Setup on the Performance of Pulsed Plasma Thruster

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Pulsed Plasma Thruster (PPT) has been regarded as one of potential micro-propulsion devices for the Micro-satellites such as Cubsats. Capacitor setup is a main issue of PPT to meet the restricted geometric demand and also have great influence on the main performance parameters of PPT such as impulse bit, specific impulse and thrust efficiency. To facilitate the configuration design of PPT, the influence of capacitor setup on the performance was investigated in this paper. It has been concluded that capacitor setup affects the performance of PPT by varying the inductance and resistance of circuit loop. Firstly, some typical capacitor setups for both breech and side feed configurations were summarized based on the existed configurations of PPT. Furthermore, the external electrical parameters, including the inductance and resistance of capacitor(s) and external wires, were analyzed in several situations. Finally, the performance of PPT with the different external electrical parameters was simulated based on the electromechanical model and the Influence of capacitor setup on the performance parameters was then presented.