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EXPERIMENTAL INVESTIGATION OF SELF-EXCITATION INFLUENCE ON LOW FREQUENCY
OSCILLATIONS OF SPT**Abstract**

The low frequency oscillation (LFO) of discharge current is one of the characteristics of SPT. It has notable effect on the power source of the thruster and shortens the life of the wall of the channel, and can even stop the discharge. So people pay attention to how to reduce the low frequency oscillation. This paper outlines the current research on low-frequency oscillation in every country and the impact of the magnetic field on of the discharge current. It points out that the curvature center of magnetic field configuration that sets with the channel center has an important influence on the plume and oscillation and analyses a magnetic field equivalence principle : since ATON-SPT doesn't directly work from the self-excitation, magnetic field strength can not meet the requirements with small electricity .To enhance the magnetic field, we should increase the magnetic field coil turns as the basis of self-excitation data ,which makes magnetic field basically unchanged. Based on this, the paper explains the principle of the decreased discharge current oscillations of self-excitation, the mechanism that self-excitation mode reduces the coupling between the shocks of discharge excitation current and discharge current. The feedback effect of the excitation and discharge curbs discharge current oscillation to some extent. When the voltage of the excitation coils' ends is higher than the voltage Tube Regulators' regulators value, it effectively controls the excitation current size and the magnetic field configuration and size in the channel, Paralleling the high-frequency oscillation signal of discharge current bypass capacitor and reducing the current oscillations in excitation coil loop can make thruster working stably. At last we find the LFO of discharge current and weight of propeller are obviously reduced in self-excitation compared with independent excitation.