Discharge characteristics optimization of a pulsed plasma microaccelerator

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This study is dedicated to increasing an ablative pulsed plasma thruster (APPT) efficiency, as it rarely exceeds 10% and this is the main problem [1, 2]. This issue prevents APPT from being widely used on the such small spacecrafts, as CubeSats [3]. In order to increase efficiency, thruster electrical parameters influence on the discharge processes was studied. The dependence of thrust characteristics on complex electrical parameters has been analytically revealed. The relationship between the impulse bit and the discharge voltage amplitude has been experimentally determined.
Separately, an experimental study of the propellant (polyurethane, PTFE and polycarbonate) chemical composition influence on thrust characteristics, as a result of which it was shown that the used propellant monomer structure affects gas-dynamic thrust component. The study has been performed at large-scale research facilities "Beam-M" of Bauman Moscow State Technical University.

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[2] Shumeiko A I, Telekh V D and Ryzhkov S V 2020 *Symmetry* **14** 1983
[3] O'Reilly D, Herdrich G and Kavanagh D F 2021 *Aerospace* **8**