

TESTING OF EXPERIMENTAL MODELS OF A HYDROJET WITH PULSED-DETONATION COMBUSTION OF LIQUID FUEL

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Abstract: Experimental models (EMs) of a pulse-detonation hydrojet (PDH), a new type of thruster for water propulsion, were designed, manufactured, and tested. Fire tests of PDH EMs with combustors of different design 2 l in volume were performed on a specially designed experimental rig which made it possible to create an approach stream of water with a speed of up to 10 m/s. By comparing the attained values of the fuel-mixture based specific impulse in the multicycle PDH operation, the most promising design of the PDH has been proposed exhibiting the specific impulse exceeding 350–400 s. It is shown that the measured values of the time-averaged thrust and specific impulse in the first working cycle are always significantly higher than in the subsequent cycles: 400–760 N and 900–2600 s, respectively, which indicates the potential for increasing the thrust performances of the PDH.

Keywords: hydrojet engine; pulsed-detonation combustion; experimental model; specific impulse; thrust

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