

# PARAMETRIC STUDY OF THE INFLUENCE OF NOZZLE ON THRUST PERFORMANCE OF CONTINUOUS-DETONATION COMBUSTION CHAMBER

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**Abstract:** A parametric numerical study of the influence of nozzle on thrust performance of the experimental annular continuous-detonation combustion chamber 406 mm in outer diameter with an annular gap of 25 mm and a tapered central body (semiapex angle  $23^\circ$ ), operating on hydrogen and air has been performed. Varied in the calculations were the length of the extension limiting the rate of flow expansion, the length of the combustion chamber, the shape of the central body (cone or truncated cone), and the way the exhaust jet enters the environment, allowing the jet to enter a half-space or a full space. It is shown that the maximum thrust (7.7 kN) is reached when the chamber length (395 mm) is close to chamber outside diameter, when a full conical central body is used and in the absence of the extension. Reduction in the length of the chamber, the use of the central body in the shape of truncated cone, and expansion of the exhaust jet into the full space lead to reduction in thrust.

**Keywords:** continuous-detonation combustion chamber; hydrogen; air; thrust performance; nozzle; numerical simulation

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