

Mathematical Simulation of Performance Parameters of Pulse Detonation Engine

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Abstract : Due to its simplicity, Pulse detonation engine technology has recently emerged as a future aerospace propulsion technology. In this paper, we studied various parameters affecting the performance of Pulse detonation engine (PDE) like tube length for proper deflagration to detonation transition (DDT), tube diameter (combustion tube), tube length, Shelkin spiral, Cell size, Equivalence ratio of fuel used etc. We have discussed various techniques for reducing the length of pulse tube by using various DDT enhancing devices. The effect of length of the tube from 40 mm to 3000 mm and diameter from 10 mm to 100 mm has been analyzed. The fuel used is C₂H₂ and oxidizer is O₂. The results are processed in MATLAB for drawing valid conclusions.

Keywords : pulse detonation engine (PDE), deflagration to detonation (DDT), Schelkin spiral, cell size (λ)

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