

Direct thrust force measurement of pulse detonation engine

Abstract

In this paper we present the result of High-Speed Reacting Flow Laboratory (HiREF) pulse detonation engine (PDE) experimental study on direct thrust measurement. The thrust force generated by the repetitive detonation from a 50 mm inner diameter and 600 mm length tube was directly measured using load cell. Shchelkin spiral was used as an accelerator for the Deflagration to Detonation Transition (DDT) phenomenon. Propane-oxygen at stoichiometric condition was used as the combustible fuel-air mixture for the PDE. The PDE was operated at the operation frequency of 3Hz during the test. The amount of thrust force that was measured during the test reaching up to 70N. These values of thrust force were found to be fluctuating and its combustion phenomenon has been analyzed and discussed.