Performance and Some Structural Aspects on the Design Pulse Detonation Engine

Abstract

The objective of the present work is to develop a general one-dimensional analytical model for the impulse of a single cycle pulse detonation engine (PDE). The model is based on the history of pressure at the thrust surface of the detonation tube. The model is validated against theoretical results that obtained in the literature. Performance parameters include, thrust specific fuel consumption, frequency limits, and thrust to weight ratio have been estimated over a range of operating conditions. The structural aspects, such as yield stress, engine weight, and flexural wave are also considered and obtained in this work. The calculation routines are ideally suited to excel programs sheet calculator, and hence the designed model has been laid out according to this calculator outputs. For further work, preliminary design study is identified for both performance and structural aspects.