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Determination performance of thermoacoustic heat engine simulation by delta EC software

Abstract

Thermoacoustic Heat Engine probably the most efficient energy source for electronic devices for the next 10 year ahead that require small amount of electrical energy to operate. This study was to simulate the Thermoacoustic Heat Engine (TAHE) standing wave system by conducting a Fluid Structure Interaction (FSI) by using a Thermoacoustic system's software named DeltaEC for better uderstanding on the fundamental of TAHE standing wave system. Some characteristics or parameters in the system that were studied in order to derive the fundamental knowledge of TAHE standing wave system. The thickness of Hot Heat Exchangers (Hot HX) plays the major role in affecting the maximum acoustic power generated, the level of onset temperature difference and maximum pressure amplitude followed by the stack length. Hot HX dimension (thickness) contributes nearly 3.3% changes in maximum acoustic power where the lowest thickness scores the highest maximum acoustic power generated. 2.9% of increment on maximum acoustic power generated by altering the length of the stack by 5 mm.

Keywords; Delta E.C.; Hot Heat Exchanger; Thermoacoustic Heat Engine