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Design, construction and characterization of a solar thermoacoustic engine FABRISIO L. GÓMEZ, GUADALUPE HUELSZ, Centro de Investigación en Energía (CIE), UNAM, Temixco, Morelos — We designed, constructed and characterized a thermoacoustic engine that operates with solar radiation concentrated by a Fresnel's lens. The resonator is a Pyrex tube closed in one of its ends and opened in the other one. The stack is built of a ceramic piece with parallel channels. The Fresnel's lens concentrates the direct solar radiation on the end of the stack near to the closed end of the resonator. A structure supports the elements of the engine and allows following the direct solar radiation in a manual form. The acoustic pressure amplitude of the generated stationary wave was measured with a microphone located 1 cm away from the opened end, but it was impossible to measure it in the closed end since the concentrated solar radiation goes through this end, and the placement of any microphone would obstruct its passage. Therefore we made an engine warmed by an electrical resistance in which it is possible to place a microphone in both ends of the resonator. Using the electric engine we reproduced the wave generated by the solar engine to estimate the acoustic pressure amplitude in its closed end.

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