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Combustion instability control in the model of combustion chamber

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Abstract

An experimental study of the influence of external periodic perturbations on the instability of the combustion chamber in a pulsating combustion. As an external periodic disturbances were used sound waves emitted by the electrodynamics. The purpose of the study was to determine the possibility of using the method of external periodic perturbation to control the combustion instability. The study was conducted on a specially created model of the combustion chamber with a swirl burner in the frequency range from 100 to 1400 Hz. The study found that the method of external periodic perturbations may be used to control combustion instability. Depending on the frequency of the external periodic perturbation is observed as an increase and decrease in the amplitude of the oscillations in the combustion chamber. These effects are due to the mechanisms of synchronous and asynchronous action. External periodic disturbance generated in the path feeding the gaseous fuel, showing the high efficiency of the method of management in terms of energy costs. Power required to initiate periodic disturbances (50 W) is significantly smaller than the thermal capacity of the combustion chamber (100 kW).

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