

# REGIMES OF SUPERSONIC FLAME PROPAGATION IN CHANNELS AND CRITERIA OF THEIR REALIZATION

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**Abstract:** The paper discloses physical mechanisms determining evolution of trans- and supersonic regimes of flame propagation through the channel filled with a gaseous combustible mixture. The origin of quasi-steady supersonic flame propagation, transition to detonation, and autoignition ahead of the flame is discussed. On the basis of detailed analysis, three basic criteria are formulated which allow one to determine the probability of different regimes depending on the initial composition and state of the mixture. Formulated criteria are in the qualitative agreement with the experimental data on combustion of hydrogen-based mixtures.

**Keywords:** combustion in channels; choking flame; supersonic flame; deflagration-to-detonation transition (DDT); DDT limits

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Received December 29, 2016

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