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MATHEMATICAL MODELING OF PULSATING DETONATION WAVE USING NON-OSCILLATING NUMERICAL SCHEMES OF DIFFERENT APPROXIMATION ORDERS

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The mathematical modeling of one-dimensional detonation wave propagation in the context of one-step chemical reaction model corresponded to the acetylene-air and hydrogen-air mixtures in the physical statement with the direct detonation initiation near the closed end of the channel is carried out. The character of detonation wave propagation in acetylene-air mixture qualitatively and quantitatively corresponds to the theoretical predictions. At the same time the longtime detonation wave evolution in hydrogen-air mixture fails for the numerical schemes with approximation orders from the first to the fourth. The detonation wave propagation patterns are different for the different schemes but all of them include the transition from some regular mode to the irregular marginal one with subsequent detonation breakup.

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