
Evolution of vertex disturbances at various stages of turbulent flows

© M.F. Ivanov¹, A.D. Kiverin¹, E.D. Shevelkina²

¹Joint Institute for High Temperatures of the Russian Academy of Sciences, Moscow, 125412, Russia

²Bauman Moscow State Technical University, Moscow, 105005, Russia

The paper studies numerically the features of transient acceleration of the flame and sequential detonation formation inside three-dimensional rectangular channel filled with hydrogen-oxygen mixture. The features of the flame evolution are analyzed for flames with different topology of the reaction surface. It is shown that independent on the geometry factors and the features of the flow inside the channel the detonation forms as a result of flame acceleration in a self-sustaining regime determining the pressure increase in the reaction zone.

Keywords: *isotropic turbulence, turbulence decay, numerical simulation.*

Ivanov M.F. (b. 1945) graduated from the Mechanical-Mathematical Department of Moscow State University in 1968. Dr. Sci. (Phys. & Math.), Professor, Head of the Laboratory of Mathematical Modeling of Joint Institute for High Temperatures of Russian Academy of the Sciences. Author of more than 200 papers, including 2 monographs. Areas of expertise: computational physics, plasma physics, physical gasdynamics. e-mail: ivanov_mf@mail.ru

Kiverin A.D. (b. 1985) graduated from the Physics Department of Bauman Moscow State Technical University in 2008. Ph.D., Senior Researcher of Joint Institute for High Temperatures of Russian Academy of Sciences. Areas of expertise: computational physics, physical gasdynamics. e-mail: alexeykiverin@gmail.com

Shevelkina E.D. (b. 1991), a student of Bauman Moscow State Technical University, Laboratory Assistant of Joint Institute for High Temperatures of Russian Academy of Sciences. Spheres of scientific interest: computational physics, physical gasdynamics.
