

# DEVELOPMENT OF A MODEL OF HYBRID DETONATION IN A MIXTURE OF OXYGEN–HYDROGEN–ARGON WITH ALUMINUM PARTICLES\*

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**Abstract:** A simple mathematical model of hybrid detonation in oxygen–hydrogen–argon mixtures with suspended aluminum particles is suggested. The model is based on the approaches of the mechanics of multiphase media and equations of reduced chemical kinetics to describe gaseous and heterogeneous reactions. Production of alumina in the form of nanoparticles is considered. The problem of initiation and propagation of cellular detonation in a planar channel is analyzed. The results of calculations show that addition of small amount of combustible particles leads to increase in the detonation velocity and transformation of the cellular structure.

**Keywords:** numerical simulation; hybrid detonation; aluminum particles; oxygen–hydrogen mixtures

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