ON MODELING OF GASEOUS DETONATION IN POROUS MEDIA BY THE ONE-DIMENSIONAL REACTIVE EULER EQUATIONS

A. R. Kasimov\(^1\) and R. E. Semenko\(^2\)

\(^1\)Applied Mathematics and Computational Science, King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia
\(^2\)Department of Mechanics and Mathematics, Novosibirsk State University, 2 Pirogova Str., Novosibirsk 630090, Russian Federation

**Abstract:** The problem of propagation of gaseous detonation in a packed bed of inert motionless solid particles is investigated. The modeling is based on the one-dimensional (1D) system of reactive Euler equations that includes the losses of momentum and heat. The heat release in gaseous reactions is assumed to be given by an overall one-step reaction governed by the standard or generalized Arrhenius law. The authors have attempted to make quantitative predictions of the observed experimental data by varying the thermokinetic parameters of the mixture. The role of these parameters in the observed discrepancies between theory and experiment is discussed.

**Keywords:** detonation theory; detonation with losses

**References**


Received November 17, 2015

Contributors

**Kasimov Aslan R.** (b. 1969) — Ph.D., Professor, Applied Mathematics and Computational Science, King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia, aslankasimov@gmail.com

**Semenko Roman E.** (b. 1986) — Candidate of Science in physics and mathematics, Lecturer, Department of Mechanics and Mathematics, Novosibirsk State University, 2 Pirogova Str., Novosibirsk 630090, Russia, rsem86@mail.ru