Mathematical modeling of shock wave interaction with moving and colliding bodies

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The work is devoted to the mathematical modeling of shock wave propagation in the areas with moving bodies. The problem relates to the clarification of the mechanisms of shock wave–particles cloud interaction. Mathematical model is based on two-dimensional Euler equations. The numerical algorithm of Cartesian grid method extends the ideas from [1]. The developed algorithm was verified on a number of test cases about the motion of bodies under the action of pressure force from [1–3]. The detailed simulations of shock wave–one movable cylinder interaction are carried out with classification of possible regimes of flows and wave patterns depending on mass of the cylinder and the intensity of the shock wave. The detailed simulations of the interaction of shock wave with two movable cylinders that can collide with momentum losses are carried out with classification of possible regimes of flows and wave patterns depending on parameters of the problem.