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Simulation of Ram Accelerator with PETN Layer

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Simulation of a ram accelerator busted by PETN layer is the subject of the paper. There is described an idea of ram accelerator with a high explosive layer on tube walls. The layer is an additional source of chemical energy and enhances the acceleration of projectile. The paper presents numerical model of such device. The model includes submodels: gas flow and chemical reactions model, gas-wall heat transfer model and model of ignition of PETN layer. The models are interconnected by boundary conditions. Such approach was successfully used in simulation of ignition of high explosive layer by detonation wave. These results are used in model of ram accelerator. Simulation shows that it is possible to obtain several percent higher trust comparing to traditional ram-accelerators. Analysis of results shows the main limitations of the modified device and point out ways of improving it.

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