

# Numerical investigation of gas-dynamic processes in wave conductor when pressure pulsations in flow with periodic detonation waves measuring

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In experiments the parameters of periodically passing detonation waves are determined, as a rule, using the photographic record or using pressure pulsations sensors. The last ones are connected to the chamber by means of a rather long (about 1 meter) reception part of the waveguide to eliminate their contact with high-temperature combustion products. After detonation wave passing at the place of pressure tap a decaying shock wave propagates through the waveguide. Because its degeneration into the acoustic one at certain distance, the waveguide length and diameter should be selected in a such way that the shock front will remain until its registration by the sensor. A numerical study of gas-dynamic, thermal and chemical processes in a waveguide during its filling by the combustion products and periodic passage through it by shock waves are performed in this work. An annular oxygen-hydrogen detonation chamber of 40 mm diameter (designed in Institute of Hydrodynamics in Novosibirsk) was chosen as a source of periodic shock waves. The waveguide was installed on the end chamber wall. It is shown that the decrease of gas temperature to the initial temperature of waveguide walls occurs at a length of about 50 calibers. The dependence of the amplitude of pressure oscillations from the channel length is obtained. Thus, at a distance of 1 m from the place of pressure tap the amplitude of 2 kHz pulsations is reduced by approximately 20 times.