

Poster 1

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Experimental study of initial stage of instability development on gases interface under influence of shock wave front acceleration

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Results of experimental study in instability development on flat interface of noble gases under influence of shock wave front acceleration are described in the paper. Instability development was observed after strong decelerating shock wave with $M = 3.3 - 4.5$, generated in electromagnetic shock tube (EST) passed through the interface. The phenomenon was recorded by schlieren system of shadow imager IAB-451.

Analysis of experimental data was performed by 1D numerical simulation of flow dynamics in EST with preset stable interfaces.

It has been demonstrated that under experimental conditions in EST thin nitrocellulose membranes originally separating gases were burning under effect of heat irradiated by shock compressed gases prior to shock wave arrival to investigated interface.

It has been demonstrated that the width of disturbance zone in initial stage of instability development increases proportionally to $t^{1/2}$.

Empirical equation of disturbance zone dependence versus time and parameters of gases flow on the interface has been drawn up. This equation describes development of disturbance zone up to turbulization of flow.