NUMERICAL RESULTS MODELING GAS-DYNAMIC EXPERIMENTS ON TURBULENT MIXING IN 2D FLOWS

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Currently, RFNC-VNIIEF computations of turbulent mixing (TM) occurring in 1D and 2D flows widely use Nikiforov's model. This paper presents numerical results modeling experiments on TM developing at interfaces in three-layer gaseous systems after the passage of a shock. Three cases were selected for the modeling, with one interface oblique with respect to the tube centerline and the other interface transversal to the tube centerline. In one case there is a shock circulating within the central layer, in the other two cases it is a rarefaction wave. The computations were performed with the CORONA code and the 2D version of the modified Nikiforov's model. Numerical results are compared with experimental data on the TM zone width.

All these cases are of interest for the verification 2D TM codes. In case 1 TM develops in an essentially two-dimensional flow and covers the greater part of the central layer in the three-layer gaseous system. In case 2, TM intensity at interfaces I1 and I2 is different: at I1 TM zone width varies considerably as we are moving along the interface, while at interface I2 TM is weaker, and TM zone width does not change significantly along the interface. In case 3, TM develops at interfaces that are noticeably deformed as the system moves.