

Poster 2

Baban & Kozlovskih

Investigation of gravitational turbulent mixing at sign-variable acceleration

Sergey Baban & Alexander Kozlovskih

RFNC–VNIITF,
Snezhinsk, Russia
s.a.baban@vniitf.ru

We considered the modification of turbulent mixing model for the description of a separation at sign-variable acceleration. The model was obtained from the analysis of the equations for turbulent flows of concentration and density. $K\varepsilon$ model [1] was added with items and the equation, containing the coefficient of heterogeneity Γ .

The model was investigated in case of two incompressible fluids in a field of gravity. It is shown, that in an unstable case the dimensionless velocity of development of turbulent zone depends on the coefficient of heterogeneity Γ . This fact is a possible explanation of a distinction of experimental data. The stable phase begins, when the sign of acceleration changes. The zone of turbulent mixing decreases in this case. This fact is in the consent with experimental data [2] and results of direct numerical simulation [3]. Development of a mixing zone depends from Γ in this case. There is a full separation if $\Gamma=1$ and separation does not occur if $\Gamma=0$.

References

1. V.E. Neuvazhayev, V.G. Yakovlev. 1988 //VANT, Theoretical and applied physics, (1), p. 28-36.
2. Yu.A. Kucherenko, V.E. Neuvazhayev, A.P. Pylaev. 1994 //DAN, 334, №4 p. 445-448.
3. D.L. Youngs. 1997 // Proc of the Sixth International Workshop on the Physics of Compressible Turbulent Mixing, France, Marseille, p.534-538.