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Numerical investigation of gravitational turbulent mixing with alternating-sign acceleration

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The turbulence evolving in gravity field at a plane interface of two incompressible fluids with density ratio $n=3$ under alternating-sign acceleration is investigated by direct numerical simulation using 3D TREK code.

The results obtained were averaged to determine the moments of the following hydrodynamic quantities: diagonal Reynolds tensor components (turbulent energy), turbulent flows, density profile, and mean-square-root pulsation of velocity.

The resultant values are compared to the predictions by phenomenological models of turbulence [1,2] and the turbulent mixing zone width dependencies are also compared to the available data of experiments [3,4].

The single-point function of probability density is constructed basing on the processed results of direct numerical simulation.

References

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