Longitudinal correlation functions and the intermittency

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A time dependence for second-order and third-order longitudinal correlation functions are considered in the intermittency model [1], i.e. we use the following model: flow is considered as a mixture of turbulent and viscous regimes. Both regimes have Loitsyansky invariants and Kolmogorov's (for turbulent regime) and Millionshchikov's (for viscous regime) self-similarities.

Gradient hypothesis of Lytkin and Chernykh [2] is used to make Karman-Howarth equation closed by the expression of the two-point third-order correlation moment through the two-point second-order correlation moment in the regime of Kolmogorov turbulence in the inertial range.

A model dependence obtained for the longitudinal correlation coefficient has asymptotically exponential form of decay and is in good agreement with the experimental data of Batchelor-Townsend-Stewart [3].

Продольные корреляционные функции и перемежаемость

Турбулентный поток предполагается однордным и изотропным. Рассматривается зависимость от времени продольных корреляционных функций второго и третьего порядков в модели с перемежаемостью, описанной в [1]. Полученные результаты согласуются с экспериментальными [3].

References

[1] O.A. Pyrkova, A.A. Onufriev and A.T. Onufriev *Initial time behavior of the velocity in a homogeneous and isotropic turbulent flow* [in Russian] Proceedings of MIPT **3** (2011), No. 1, 127–131.

[2] Yu.M. Lytkin, G.G. Chernykh *One method of closing the Karman-Howarth equation* [in Russian] Dynamics of Continuous Media **27** (1976), 124–130 .

[3] O.A. Pyrkova *Behavior of the third-order longitudinal correlation functions in the intermittency model* Materials tenth international summer school of the Kazan conference [in Russian] **43** (2011), 295–296.