DIFFUSION AND CORRELATIONS OF MAGNETIC FIELD IN A TURBULENT MEDIUM

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ABSTRACT. The diffusion and correlations of a magnetic field in a homogeneous isotropic turbulent medium are considered. The turbulent diffusivity $\alpha_T(\xi)$ and the generation coefficient $\alpha_T(\xi)$ in a medium with helicity are derived as the functions of the Strouhal number $\xi = u_0 r_0 / R_0$, where u_0, r_0 and R_0 are the characteristic velocity, the lite time and the correlation length, respectively. The explicit formulae for the second order correlators of magnetic field are derived. It is shown that the initial magnetic fluctuations may be strictly amplified by the turbulent motions for a short time and then decreased to zero due to the action of the ohmic dissipation.