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THE CALCULATION OF THE TURBULENT DIFFUSIVITIES OF MAGNETIC FIELDS AND PARTICLES USING THE NON-LINEAR EQUATIONS FOR THE GREEN FUNCTION

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ABSTRACT. *The hierarchy is derived of non-linear equations for the averaged Green function which describes the process of transportation of an admixture magnetic field and particles in the turbulent medium. For non-compressible medium the simplest non-linear equation with the second order non-linearity can be easily solved numerically by the iterative procedure which is analogous to chain fraction iterations. The exact numerical solutions of this equation and also the approximate analytic formulae are used for calculating turbulent diffusivities for some types of turbulence - the spectrum of turbulence E (p) is of Kolmogoroff's type E (p) ~* $p^{-5/3}$ *and* $E(p) \sim \delta(p - p_*)$. *It is shown that this method allows us to calculate the turbulent diffusivities with a good accuracy for all values of the parameter* $\xi = \tau V R_*$, *where* V, τ *and* R_* *are the characteristic velocity, lifetime and spatial scale of the turbulent pulsations of basic gas.*