

Abstract Submitted
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Closure theories for inhomogeneous turbulence ROBERT RUBIN-STEIN, NASA Langley Research Center — Although Kraichnan formulated the Direct Interaction Approximation and the Test-Field model for general problems of inhomogeneous turbulence, the resulting equations, requiring repeated integrations over the flow domain, are both difficult to understand and difficult to apply in practice; in the homogeneous case, triad interactions provide the key to unraveling the physics of the approximation. The goal of this work is to formulate some special inhomogeneous problems with comparable simplicity. It is done by decomposing the inhomogeneous problem into a set of coupled quasi-homogeneous problems, each of which admits a simple formulation. The formalism will be applied to the problem of weakly inhomogeneous turbulence, where previous heuristic theories have proven incomplete. The same formalism applies to problems admitting scaling transformations; it will be applied to give a simple formulation of the problem of turbulence in a half-space.

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