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Distribution of Sizes and the Internal Structure of the Fragmented ("Mixed") State Induced by Rayleigh-Taylor Instability[1] GIORA HAZAK, Berkeley Research Associates, Inc., and Physics Department, Nuclear Research Center, Negev, Beer Sheva ISRAEL, YONATHAN ELBAZ, Physics Department, Nuclear Research Center, Negev, Beer Sheva ISRAEL, J.H. GARDNER, Berkeley Research Associates, Inc., A.L. VELIKOVICH, A.J. SCMITT, S.T. ZALESAK, Plasma Physics Division, NRL — A study, based on simulations and experiments as well as analytical derivations, of the fragmented ("mixed") state induced by the Rayleigh-Taylor instability at the interface between two fluids is presented. The distribution of sizes and the energy spectrum in the fragmented state are derived from the symmetries exhibited by the data. The exact (but not closed) kinetic equations for the distribution functions which describe the internal structure of the mixed state are derived. These equations resemble the kinetic equations for single-component inhomogeneous turbulence (T. S. Lundgren, Phys. Fluids **10**, 969 (1967)) but with additional terms which account for the effect of the sharp interface between the components. The capacity of these equations is tested by using a simple "Vlasov-like" closure. As expected, in the linear limit, the equations lead to the Rayleigh-Taylor dispersion relation.

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