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The effective surface tension coefficient in two-phase flows with interface in the framework of group-theoretical model of turbulence MIKHAIL GOROKHOVSKI, Ecole Centrale de Lyon, VLADIMIR SAVELIEV, Institute of Ionosphere Almaty Kazakhstan — In our paper PRE 72, 016302 (2005), three main results concern: (i) a new model of stationary homogeneous turbulence on the basis of the Euler equations; (ii) the regularized averaging formula for the product of two fields; (iii) the renormalization of the Navier-Stokes equation in which the turbulent viscosity appeared not from averaging of the nonlinear term, but from the molecular viscosity term. The new raised question is as follows. In immiscible gas-liquid turbulent flows with a fluid-interface, the Navier-Stokes equations are completed by the surface tension force, acting on the interface. Then in the framework of the aforementioned paper, what is the renormalized form of this force at a high Weber and Reynolds numbers, and in terms of LES, what are the governing equations. The result is this: the surface tension force appears in its effective ("turbulent") form, which depends on the filtered strain rate, the thickness of the filter, and the ratio between dissipative and critical scales. Also different formulations of the specific volume transport equation are discussed.

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