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A Fick-relaxation BGK operator for general mixtures of gases

Abstract

In this talk, we extend the derivation of the Fick-relaxation BGK model to a setting which includes both monoatomic and polyatomic gases. The construction of the present model is based on the introduction of relaxation coefficients and by solving an entropy minimisation problem. The distribution functions of each species are described by adding a supplementary continuous variable collecting vibrational and translational energies. Finally, by using a Chapman-Enskog equation, we recover the Fick matrix, the volume viscosity and the shear viscosity.