Polym Sci, 3:3
DOI: 10.4172/2471-9935-C1-003

Double-decked model of the flow of polymeric incompressible fluid past a flat wedge

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As known, polymeric fluids consists of very large molecules (macromolecules) which causes remarkable properties of these fluids. Polymer melts has a non-linear viscoelastic behavior so a number of rheological model was developed to describe its motion. One of the most popular type includes mesostructural (or statistical) models. They are based on molecular structure of the substance and considers the processes of intermolecular interactions. This approach allows the one to study the connection be-tween macroscopical and microscopical scales. Usually mesostructural models uses reptation theory which consider long linear entangled macromolecules. Often macromolecule is modeled as set of beads connected by springs which represents an elastic forces. We will use mesostructural model which is the modified Vinogradov-Pokrovskii model.. It considers friction between beads of a macromolecule as a tensor which is connected to the anisotropy of a shear flow. This anisotropy tensor is determined by size and shape of macromolecules. If the flow of polymermelts has non-zero velocity gradients then macro-molecules deforms along the flow which makes a media anisotropic. Our goal is to study the behavior of polymeric fluid for classical type of flows which is the flow past theflat infinite wedge. It is well-known that stationary solutions for supersonic flow of fluid past the wedge has surface of strong discontinuity of a shock wave type. We are looking for the similar type of the flow for polymeric fluids using modified Vinogradov Pokrovskii model. We showed classical scheme of stationary flow past the wedge has to be modified for polymeric fluid by adding extra surfaces of strong discontinuities (we have called this type of flow as adouble-decked model).

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