

Attractors for a several models of motion of viscoelastic media

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Abstract

Attractors for models of Newtonian hydrodynamics is well known (O.A. Ladyzhenskaya, M.I. Vishik, etc.). But models of non-Newtonian hydrodynamics require the development of a more general abstract theory. It was done previously (see e.g. Zvyagin V.G., Vorotnikov D.A. Topological Approximation Methods for Evolutionary Problems of Nonlinear Hydrodynamics // Walter de Gruyter, Berlin-New York, 2008). On the basis of this developed theory of attractors it is supposed to consider attractors following models of non-Newtonian hydrodynamics in the talk:

- 1) Jeffreys models of motion viscoelastic media like crust
- 2) Models of motion viscoelastic media with memory
- 3) Models of motion low concentrated aqueous polymer solutions

As an example we describe the equation of Jeffreys model:

$$\frac{\partial v}{\partial t} + \sum_{i=1}^n v_i \frac{\partial v}{\partial x_i} - \text{Div} \sigma + \text{grad} p = f,$$
$$\sigma + \lambda_1 \left(\frac{\partial \sigma}{\partial t} + \sum_{i=1}^n v_i \frac{\partial \sigma}{\partial x_i} \right) = 2\eta \left(\mathcal{E} + \lambda_2 \left(\frac{\partial \mathcal{E}}{\partial t} + \sum_{i=1}^n v_i \frac{\partial \mathcal{E}}{\partial x_i} \right) \right).$$

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