DISSIPATIVE SOLVABILITY
OF JEFFREYS–OLDROYD-α MODEL

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Abstract. We study the initial-boundary value problem for the so-called
alpha model of Jeffreys–Oldroyd fluids motion in 2D and 3D dimensions.
In this paper the global in time existence of dissipative solutions to this
problem is obtained. For this the topological approximation method to the
initial-boundary value problem is applied.

1. Introduction

At the recent thirty years *alpha models* of hydrodynamics are intensively
investigated and popularized. These models in comparison with the original
models represent a kind of approximation, which depends on the parameter α.
Alpha model differs from the original one by replacement in a number of terms
the velocity function v by a smoother function u connected with v. The idea
of using such approximations for the study of original models first arose in the
work by J. Leray [14]. Later, based on the idea the theory of alpha models, in
which the vector-valued velocity function v is replaced in a series of terms by
a smoother one u connected with v by the elliptic system $v = u - \alpha^2 \Delta u$, has
been constructed. The used operator is the well known Helmholtz operator. The