

Accepted Manuscript

Differential invariants for spherical layer flows of viscid fluids

Anna Duyunova, Valentin Lychagin, Sergey Tychkov

PII: S0393-0440(18)30219-5

DOI: <https://doi.org/10.1016/j.geomphys.2018.04.005>

Reference: GEOPHY 3198

To appear in: *Journal of Geometry and Physics*

Received date: 17 February 2018

Revised date: 1 April 2018

Accepted date: 9 April 2018

Please cite this article as: A. Duyunova, V. Lychagin, S. Tychkov, Differential invariants for spherical layer flows of viscid fluids, *Journal of Geometry and Physics* (2018), <https://doi.org/10.1016/j.geomphys.2018.04.005>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Differential invariants for spherical layer flows of viscid fluids

Anna Duyunova,

Bauman Moscow State Technical University,
Institute of Control Sciences of RAS,
duyunova_anna@mail.ru

Valentin Lychagin,

Institute of Control Sciences of RAS,
University of Tromsø, valentin.lychagin@uit.no,

Sergey Tychkov,

Institute of Control Sciences of RAS,
sergey.lab06@ya.ru

Abstract

Symmetries and the corresponding algebras of differential invariants of viscid fluids on a spherical layer are given. Their dependence on thermodynamical states of media is studied, and a classification of thermodynamical states is given.

1 Introduction

In this paper differential invariants of flows of compressible viscid fluids or gases on a spherical layer are studied.

The thermodynamical state of the fluid is given by the pressure $p(t, x_1, \dots, x_n)$, the density $\rho(t, x_1, \dots, x_n)$, the entropy $s(t, x_1, \dots, x_n)$ and the temperature $T(t, x_1, \dots, x_n)$. The thermal conductivity k of the fluid is constant.

The system of differential equations (the Navier-Stokes system) which describes flows on an n -dimensional oriented Riemannian man-

Download English Version:

<https://daneshyari.com/en/article/8255523>

Download Persian Version:

<https://daneshyari.com/article/8255523>

[Daneshyari.com](https://daneshyari.com)