Preface

This volume of RIMS Kôkyûroku Bessatsu is the proceedings of the RIMS workshop

“Workshop on the Boltzmann Equation, Microlocal Analysis and Related Topics”

held at Kyoto University Clock Tower Centennial Hall from May 27 though May 29, 2016. The volume contains research papers and survey articles by invited speakers of the above conference. All papers in this volume have been reviewed and are in their final forms.

The conference was planned to celebrate the sixty-fifth birthday of Professor Yoshinori Morimoto. Professor Morimoto has made great contributions to the development of the Boltzmann equation, especially smoothing effect of solutions to the Boltzmann equation without angular cutoff. Precise contributions done by Professor Morimoto are stated in the article of this volume contributed by Professor Chao-Jiang Xu.

We would express our gratitude to the speakers, participants and the staff of RIMS, who made the workshop successful. We would also express our thanks to the authors and the referees of the articles of this volume. The conference was supported by RIMS and JSPS KAKENHI Grant numbers 25400160 and 16H03945.

Kyoto in August, 2017

Hisashi Okamoto (Gakushuin University)  
Yoshio Tsutsumi (Kyoto University)  
Naomasa Ueki (Kyoto University)  
Tadayoshi Adachi (Kyoto University)  
Senjo Shimizu (Kyoto University, Editor in chief)
RIMS International Workshop 2016

Workshop on the Boltzmann Equation, Microlocal Analysis and Related Topics

Date: May 27th – 29th, 2016
Venue: Kyoto University Clock Tower Centennial Hall
Conference Room III (27th, 29th)
Internatinal Conference Hall I (28th)

Program
May 27th (Friday)
10:00--10:10  Welcome speech
    Hisashi Okamoto (Kyoto University)
10:10--11:00
    Hua Chen (Wuhan University)
    Estimates of Dirichlet eigenvalues for degenerate elliptic operators
11:10--12:00
    Karel Pravda-Starov (Université de Rennes 1)
    Null-controllability of hypoelliptic quadratic differential equations
13:45--14:35
    Yong-Kum Cho (Chung-Ang University)
    Radial positive definite functions and the Boltzmann equation
14:45--15:35
    Setsuro Fujiie (Ritsumeikan University)
    Microlocal method for the semiclassical distribution of resonances
16:00--16:50
    Huijiang Zhao (Wuhan University)
    Global large solutions to a viscous heat-conducting one-dimensional gas with temperature-dependent viscosity
May 28th (Saturday)

10:00--10:50
Takayoshi Ogawa (Tohoku University)
Global behavior of solutions to a drift-diffusion system in higher dimensions.

11:10--12:00
Yasunori Maekawa (Kyoto University)
On viscous incompressible flows around a rotating obstacle in two dimensions

14:00--14:50
Shuichi Kawashima (Kyushu University)
Discrete kinetic theory and hyperbolic balance laws

15:10--16:00
Chao-Jiang Xu (Université de Rouen and Wuhan University)
Microlocal analysis on partial differential equations
-- Some contributions by Yoshinori Morimoto

May 29th (Sunday)

10:00--10:50
Chisato Iwasaki (University of Hyogo)
Precise construction of fundamental solutions for degenerate operators and their applications

11:10--12:00
Fumioki Asakura (Osaka Electro-Communication University)
Electromagnetic Shock Tube Problem --Ionization by a single shock wave--

13:45--14:35
Renjun Duan (The Chinese University of Hong Kong)
How Besov meets Boltzmann for well-posedness

14:45--15:35
Shinya Nishibata (Tokyo Institute of Technology)
Outflow/inflow problems to symmetric hyperbolic-parabolic systems
16:00–16:50
Tong Yang (City University of Hong Kong)
Measure value solutions to the Boltzmann equation

16:50–17:00  Closing speech
Yoshio Tsutsumi (Kyoto University)

Organizers
Hisashi Okamoto (Kyoto University)
Yoshio Tsutsumi (Kyoto University)
Naomasa Ueki (Kyoto University)
Senjo Shimizu (Kyoto University, Chair)

Supported by
Research Institute for Mathematical Sciences (RIMS)
JSPS Grant-in Aid for Scientific Research 25400160 (Y. Morimoto)
JSPS Grant-in Aid for Scientific Research 16H03945 (S. Shimizu)
Table of Contents

Hua Chen and Peng Luo
Estimates of Dirichlet eigenvalues for degenerate elliptic operators 1

Yong-Kum Cho, Yoshinori Morimoto, Shuaikun Wang and Tong Yang
A remark on the generalized Toscani metric in probability measures with moments 25

Jean-François Bony, Setsuro Fujiié, Thierry Ramond and Maher Zerzeri
Quantization condition for multi-barrier resonances 43

Huijiang Zhao
Global wellposedness near Maxwellians for some kinetic equations in the perturbative framework 55

Takayoshi Ogawa and Senjo Shimizu
Remark on the uniqueness of a mild solution of the Boltzmann equation in the critical Besov space 83

Mitsuo Higaki, Yasunori Maekawa and Yuu Nakahara
On the two-dimensional steady Navier-Stokes equations related to flows around a rotating obstacle 107

Shuichi Kawashima
Discrete kinetic theory and hyperbolic balance laws 123
Chao·Jiang Xu
Microlocal analysis on PDE: Some contributions by Yoshinori Morimoto around kinetic equations

Chisato Iwasaki
Precise construction of fundamental solutions for degenerate operators and their applications

Fumioki Asakura and Andrea Corli
A mathematical model of ionized gases: Thermodynamic properties

Shinya Nishibata
Outflow/inflow problems to symmetric hyperbolic-parabolic systems