Microlocal Day #2

Imperial College London, UK

3 December, 2010

Organisers

Claudia Garetto
Michael Ruzhansky

(Imperial College London)

The workshop is related to the Daiwa Adrian Prize for the UK-Japan Collaboration

Conference Venue: Room 642 for 10am-1pm, and room 139 for 2pm-6:30pm, Huxley Building, Imperial College London

Address : Department of Mathematics, Imperial College London, 180 Queen's Gate, London SW7 2AZ, United Kingdom

The Microlocal Day is a new initiative of a short and intensive series of lectures devoted to different aspects of the microlocal analysis and related topics. The program includes research lectures as well as survey lectures aimed at researchers and PhD students interested in the subject. All are welcome to attend.

The previous Microlocal Day #1 was held in June 2010.

Speakers

- **Fumihiko Hirosawa** (Yamaguchi University, *Japan*)
- **Ilia Kamotski** (University of Bath, *UK*)
- **Naoto Kumano-go** (Kogakuin University, *Japan*)
- **Tokio Matsuyama** (Tokai University, *Japan*)
- **Mitsuru Sugimoto** (Nagoya University, *Japan*)
- **Mirko Tarulli** (Imperial College London, *UK*)
- **Naohito Tomita** (Osaka University, *Japan*)
- **Jens Wirth** (University of Stuttgart, *Germany*)

Schedule

Friday, 3 December, 10:40am–1pm, Imperial College, Room **642**

- **10:40am** Coffee/Tea
- **11am** Opening Ceremony
- **11:05-11:45** Naohito Tomita (Osaka University, *Japan*) *A Hörmander type multiplier theorem for multilinear operators*
- **11:55-12:25** Ilia Kamotski (University of Bath, *UK*) *Boundary value problems in irregular domains and applications*
- **12:30-13:00** Mirko Tarulli (Imperial College London, *UK*) *On the smoothing-Strichartz estimates*

Friday, 3 December, 2pm–6:35pm, Imperial College, Room **139**

- **14:00-14:40** Fumihiko Hirosawa (Yamaguchi University, *Japan*) *On the energy estimates for second order homogeneous hyperbolic equations with Levi-type conditions*
- **14:50-15:30** Jens Wirth (University of Stuttgart, *Germany*) *Phase space analysis for hyperbolic systems*
- **15:40-16:20** Naoto Kumano-go (Kogakuin University, *Japan*) *Path integrals for Gaussian processes as analysis on path space by time slicing approximation*
- **16:30-16:50** Coffee/Tea
- **16:50-17:30** Tokio Matsuyama (Tokai University, *Japan*) *Dispersion for 3D wave equation with a potential in an exterior domain*
- **17:40-18:20** Mitsuru Sugimoto (Nagoya University, *Japan*) *On some Lp-type estimates for evolution operators*
- **18:30** Closing Ceremony

For further information please contact

Michael Ruzhansky at this e-mail address

Suggestion of hotels in the area (Earl's Court Station, 15 mins walk to Imperial College)

Merlyn Court Hotel

Maranton House Hotel
Barkston Gardens
City Hotel Kensington

How to get to the Department of Mathematics, Imperial College London

Travel to the tube station **Gloucester Road** (District, Circle, and Piccadilly Lines).
When you exit the station, turn left along Gloucester Road, crossing Cromwell Road 50 meters from the exit.
After 4-5 minutes walk along Gloucester Road, turn right to Queen's Gate Terrace.
This is a short road leading directly to the entrance of the Huxley Building, at 180 Queen's Gate. We are on floor 6.

Abstracts

Fumihiko Hirosawa (Yamaguchi University) *On the energy estimates for second order homogeneous hyperbolic equations with Levi-type conditions*

We consider the energy estimates for the Cauchy problem of second order homogeneous strictly hyperbolic equations with time dependent coefficients. In particular we focus on the smoothness and interactions of oscillating coefficients, which are crucial for the energy estimates; we shall call them a kind of Levi-type conditions.

Ilia Kamotski (University of Bath) *Boundary value problems in irregular domains and applications*

We discuss some aspects of the theory of the linear water waves, some challenges and applications.

Naoto Kumano-go (Kogakuin University) *Path integrals for Gaussian processes as analysis on path space by time slicing approximation*

We introduce the path integrals for Gaussian processes as an analysis which has functional integrals and smooth functional derivatives. More precisely, we give a fairly general class of functionals so that the path integrals for Gaussian processes have a mathematically rigorous meaning. For any functional belonging to our class, the time slicing approximation of the path integral converges uniformly on compact subsets of the configuration space. Our class is closed under addition, multiplication, translation, real linear transformation and functional differentiation. The invariance under translation and orthogonal transformation, the interchange of the order with Riemann-Stieltjes integrals and limits, the integration by parts and the Taylor expansion formula with respect to functional differentiation, and the fundamental theorem of calculus hold in the path integrals.
Reference:
[1] Naoto Kumano-go, Path integrals for Gaussian processes as analysis on path space by time slicing approximation, Integration: Mathematical Theory and Applications, Vol. 1, No. 3 (2010), pp.253-278.

Tokio Matsuyama (Tokai University) *Dispersion for 3D wave equation with a potential in an exterior domain*

In this talk I will introduce the dispersive estimates and Strichartz estimates for 3D wave equation with a potential in an exterior domain. The dispersive estimates will be proved by interpolating between pointwise estimates for the propagator and L^2 estimates. The pointwise estimates will be proved by using the spectral representation of the propagator. The key lemma is the representation formula for the perturbed resolvent of the Schrödinger operator in terms of the free resolvent in the whole space. By TT^* argument we will get the Strichartz estimates.

Mitsuru Sugimoto (Nagoya University) *On some Lp-type estimates for evolution operators*

Mapping properties of unimodular Fourier multiplier describing various type of evolution operators will be discussed. It is know that they are bounded on modulation spaces while not on Lp-spaces except for the case p=2. In this talk, the boundedness between Lp-Sobolev spaces and modulation spaces will be mainly considered. For the purpose, the inclusion relations between Lp-Sobolev spaces and modulation spaces will be determined explicitly.

Mirko Tarulli (Imperial College London) *On the smoothing-Strichartz estimates*

We present some a-priori estimates for evolution equations in mixed smoothing-Strichartz spaces. As an application we discuss Strichartz estimates for magnetic Klein-Gordon.

Naohito Tomita (Osaka University) *A Hörmander type multiplier theorem for multilinear operators*

In this talk, we consider a Hörmander type multiplier theorem for multilinear operators. The multipliers in our problem have only the limited smoothness.

Jens Wirth (University of Stuttgart) *Phase space analysis for hyperbolic systems*

In this talk some aspects of phase space analysis for hyperbolic systems will be discussed. The main focus will be on diagonalisation and decoupling of pseudo-differential hyperbolic systems in adapted symbol classes taking care of the structure of the problem at infinity.

Program and all abstracts as a pdf file

Previously organised: Microlocal Day #1