



Registered Data

[00981] Various Methods for the Analysis of PDEs

- **Session Time & Room** : [5B](#) (Aug.25, 10:40-12:20) @[G709](#)
- **Type** : Proposal of Minisymposium
- **Abstract** : There has been a strong interaction between classical analysis (theory of function spaces, harmonic analysis, geometric analysis, asymptotic analysis, real analysis, functional analysis, etc) and nonlinear partial differential equations. This minisymposium provides a forum to discuss the latest methods for the analysis of nonlinear partial differential equations arising in Mathematical Physics and to exchange ideas for further developments.
- **Organizer(s)** : Vladimir Georgiev (University of Pisa, Waseda University), Tohru Ozawa (Waseda University)
- **Classification** : [35Q55](#), [35L10](#), [46E35](#), [26D10](#), [42B37](#)
- **Minisymposium Program** :
 - 00981 (1/1) : [5B @G709](#) [Chair: Vladimir Georgiev]
 - **[03982] Carleson's problem for infinitely many fermions**
 - **Format** : Talk at Waseda University
 - **Author(s)** :
 - **Neal Bez** (Saitama University)
 - **Abstract** : Carleson's problem for the free Schrodinger equation is concerned with the minimal level of regularity that guarantees the solution converges to the initial data in an almost everywhere sense as time goes to zero. Here we consider a version of this problem for infinitely many particles.
 - **[05489] Stabilité results for the Sobolev inequality with computable constants and optimal behaviour**
 - **Format** : Talk at Waseda University
 - **Author(s)** :
 - **Maria J. Esteban** (CNRS and University Paris-Dauphine)
 - **Abstract** : In this talk I will present recent results concerning optimal quantitative stability properties for the Sobolev and logarithmic-Sobolev inequalities with computable constants. The result for the Gaussian version of the logarithmic Sobolev inequality is actually a corollary of the one for Sobolev. This is done, in an optimal manner, by a limiting argument in high dimensions. This work is the result of a collaboration with J. Dolbeault, A. Figalli, R. Frank and M. Loss.
 - **[05451] Lifespan estimate for classical damped wave equations with some initial data**
 - **Format** : Talk at Waseda University
 - **Author(s)** :
 - **Kazumasa FUJIWARA** (Ryukoku university)
 - Vladimir Georgiev (Pisa University)
 - **Abstract** : The lifespan estimate for the Cauchy problem of the semilinear classical damped wave equation is estimated when the Fourier 0th mode of the initial data is 0. In earlier works, the lifespan was estimated based on the magnitude of the Fourier 0th mode of the initial data. We will explore the lifespan estimate by considering the magnitude of the Fourier 1st and 2nd modes of the initial data instead of the 0th mode.
 - **[05511] Blow-up for the 1d cubic NLS**
 - **Format** : Talk at Waseda University
 - **Author(s)** :
 - **Luis Vega** (BCAM-UPV/EHU)

- **Abstract** : We consider the 1D cubic NLS on \mathbb{R} and prove a blow-up result for functions that are of borderline regularity, i.e. H^s for any $s < -1/2$ for the Sobolev scale and FL^∞ for the Fourier-Lebesgue scale. This is done by identifying at this regularity a certain functional framework from which solutions exit in finite time. This functional framework allows, after using a pseudo-conformal transformation, to reduce the problem to a large-time study of a periodic Schrödinger equation with non-autonomous cubic nonlinearity. The blow-up result corresponds to an asymptotic completeness result for the new equation. We prove it using Bourgain's method and exploiting the oscillatory nature of the coefficients involved in the time-evolution of the Fourier modes. Finally, as an application we exhibit singular solutions of the binormal flow. More precisely, we give conditions on the curvature and the torsion of an initial smooth curve such that the constructed solutions generate several singularities in finite time. This is a joint work with V. Banica, R. Luca, and N. Tzvetkov

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Waseda University, Tokyo, Japan

August 20-25, 2023

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