INTERNATIONAL WORKSHOP

Spectral Methods in Partial Differential Equations

Conference Program Book

October 30th—November 2nd, 2026

Nanjing, Jiangsu, China



NANJING UNIVERSITY OF AERONAUTICS AND ASTRONAUTICS

KEY LABORATORY OF MATHEMATICAL MODELING

AND HIGH PERFORMANCE COMPUTING OF AIR VEHICLES (NUAA), MIIT

Aim of the conference

Spectral analysis is a kind of Fourier analysis which is an important tool in the study of partial differential equations. Spectral methods have proven their efficiency in treating self-adjoint linear partial differential operators. In spite of a few breakthroughs during the past decades, their application to non-self-adjoint and nonlinear problems remains challenging.

The goal of this workshop is to bring together mathematicians working on different mathematical problems from quantum mechanics, kinetic equations and fluid dynamics, mostly using spectral methods, including methods of Fourier analysis (in particular, microlocal analysis and semiclassical analysis). This will be an occasion for experts and young researchers to exchange their experience and most recent ideas, and to stimulate researches in this domain.

Topics of the conference

The conference includes, but not limited to the following topics:

◆ quantum mechanics;
◆ kinetic equations and fluid dynamics;
◆ mostly using spectral methods including methods of Fourier analysis (in particular, microlocal analysis and semiclassical analysis).

Scientific Committee

Wei-Xi Li	Wuhan University, Wuhan
Changxing Miao	Institute of Applied Physics and Computational Mathematics, Beijing
Ping Zhang	Chinese Academy of Sciences, Beijing, Chairman
Zhifei Zhang	Peking University, Beijing

Organized by

◆ Nanjing University of Aeronautics and Astronautics, China
◆ Key Laboratory of Mathematical Modelling and High Performance Computing of Air Vehicles (NUAA), MIIT

INTERNATIONAL WORKSHOP
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Committee of Organisation

Vincent Bruneau	Université de Bordeaux, Talence
Hongmei Cao	Nanjing University of Aeronautics and Astronautics, Nanjing
Setsuro Fujiié	Ritsumeikan University, Kusatsu
Fengshuang Gao	Nanjing University of Aeronautics and Astronautics, Nanjing
Jie Ji	Nanjing University of Aeronautics and Astronautics, Nanjing
Xinghong Pan	Nanjing University of Aeronautics and Astronautics, Nanjing
Yitong Pei	Nanjing University of Aeronautics and Astronautics, Nanjing
Yue-Jun Peng	Nanjing University of Aeronautics and Astronautics, Nanjing
Zihao Song	Nanjing University of Aeronautics and Astronautics, Nanjing
Yingnan Sun	Nanjing University of Aeronautics and Astronautics, Nanjing
Xue-Ping Wang	Nanjing University of Aeronautics and Astronautics, Nanjing
Takuya Watanabe	Ritsumeikan University, Kusatsu
Chao-Jiang Xu	Nanjing University of Aeronautics and Astronautics, Nanjing, Chairman
Jiang Xu	Nanjing University of Aeronautics and Astronautics, Nanjing
Jianlu Yan	Nanjing University of Aeronautics and Astronautics, Nanjing
Zirong Zeng	Nanjing University of Aeronautics and Astronautics, Nanjing

Supported by

◆ National Natural Science Foundation of China
◆ Nanjing University of Aeronautics and Astronautics, China

Contact to

Jiang Xu (Nanjing University of Aeronautics and Astronautics, China)
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Registration, dining, shuttle and other Offline meeting information

Registration	**Time:** 14:00--20:00, October 30th, 2026 **Address:** Golden Eagle Summit Hotel Nanjing, No.1688 Shuanglong Avenue, Jiangning District (南京金鹰尚美酒店，江宁区双龙大道 1688 号) or Conference Venue
Conference Venue	**Address:** Main Building 12001 Academic Hall, Jiangjunlu Campus, NUAA (南京航空航天大学将军路校区 1 号楼 20 楼 12001) **Shuttle bus:** 8:10 October 31st (Hotel entrance→Building 1) 8:30 November 1st (Hotel entrance→Building 1) 8:30 November 2nd (Hotel entrance→Building 1)
Lunch	**Address:** Cuipingyuan Hong Kong Style Restaurant (翠屏苑港式餐厅) **Route:** 850 meters away, about a 12 minute walk on campus (Building 1→Restaurant)
Dinner & Dinner Party	**Address:** Little Chef's Choice (小厨娘甄选(牛首山百家湖凤凰山水店)) **Shuttle bus:** 17:30 October 31st-November 2nd (Building 1→Little Chef's Choice)

Transportation from train station or airport to hotel

Route	Public Transport	Online Ride Hailing/Taxi
Nanjing Station →Hotel	Take Metro Line 1 (towards China Pharmaceutical University), take 17 stops, and exit at Baijiahu Exit 1 (walk 300 meters), the whole journey takes about 60 minutes.	About 20 kilometers away from the hotel, a 40 minute drive, and a cost of approximately 40/60 yuan.
Nanjing South Railway Station →Hotel	Take Metro Line 1 (towards China Pharmaceutical University), take 4 stops, and exit at Baijiahu Exit 1 (walk 300 meters), the whole journey takes about 20 minutes.	The distance from the hotel is about 8 kilometers, the drive takes about 18 minutes, and the cost is about 15/25 yuan.
Nanjing Lukou Airport →Hotel	Take Metro Line S1 (towards Nanjing South Station), take 7 stops, transfer to Metro Line 1 (towards China Pharmaceutical University) at Nanjing South Station, take 4 stops, and exit at Exit 1 of Baijiahu (walk 300 meters).	About 30 kilometers away from the hotel, a 30 minute drive, and a cost of approximately 80/110 yuan.

INTERNATIONAL WORKSHOP
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Invited Foreign Experts

Vincent Bruneau	Université de Bordeaux, Talence
Hiroyuki Chihara	University of the Ryukyus, Naha
Setsuro Fujiié	Ritsumeikan University, Kusatsu
Daniel Han-Kwan	Nantes Université, Nantes
Frédéric Hérau	Nantes Université, Nantes
Kenta Higuchi	Gifu University, Gifu
Hiroshi Isozaki	University of Tsukuba, Tsukuba
François Nicoleau	Nantes Université, Nantes
Francis Nier	Université Sorbonne Paris Nord, Villetaneuse
Vesselin Petkov	Université de Bordeaux, Talence
Kouichi Taira	The University of Tokyo, Tokyo
Takuya Watanabe	Ritsumeikan University, Kusatsu

Invited Domestic Experts

Hua Chen	Wuhan University, Wuhan
Lingbing He	Tsinghua University, Beijing
Ning Jiang	Wuhan University, Wuhan
Fucai Li	Nanjing University, Nanjing
Wei-Xi Li	Wuhan University, Wuhan
Zhiwu Lin	Fudan University, Shanghai
Changxing Miao	Institute of Applied Physics and Computational Mathematics, Beijing
Zhongwei Shen	Westlake University, Hangzhou
Chao Wang	Peking University, Beijing
Kai Yang	Southeast University, Nanjing
Jiangong You	Nankai University, Tianjin
Junyong Zhang	Beijing Institute of Technology, Beijing
Ping Zhang	Chinese Academy of Sciences, Beijing
Zhifei Zhang	Peking University, Beijing



INTERNATIONAL WORKSHOP
Spectral Methods in Partial Differential Equations

Day 1: October 31st (Saturday Morning)			
8:45-9:00	Opening Speech		
Invited Lectures			
Time	**Speaker**	**Topic**	**Chair**
9:00-09:45	Hiroshi Isozaki (University of Tsukuba, Japan)	Spectral properties of higher-dimensional quantum walks	Hua Chen (Wuhan University)
09:45-10:30	Vincent Bruneau (University of Bordeaux, France)	A Poincaré-Steklov map for Dirac operators	
10:30-10:45	**Tea Break**		
10:45-11:30	Wei-Xi Li (Wuhan University, China)	Local well-posedness for the Boltzmann equation with hard potentials	Lingbing He (Tsinghua University, China)
11:30-12:15	Junyong Zhang (Beijing Institute of Technology, China)	Pointwise dispersive estimates for Schrödinger equation on manifolds with conical singularities	

Day 1: October 31st (Saturday Afternoon)			
Invited Lectures			
Time	**Speaker**	**Topic**	**Chair**
14:00-14:45	Francis Nier (Université Sorbonne Paris Nord, France)	Multiscale analysis for twisted bilayer graphene	Chao Wang (Peking University, China)
14:45-15:30	Kenta Higuchi (Gifu University, Japan)	Propagation of wave packets through a degenerate crossing in a model system	
15:30-15:45	**Tea Break**		
15:45-16:30	Ping Zhang (Chinese Academy of Sciences, China)	3-D anisotropic vs classical incompressible Navier-Stokes equations	Yue-Jun Peng (Nanjing University of Aeronautics and Astronautics, China)
16:30-17:15	Vesselin Petkov (University of Bordeaux, France)	Multiple reflecting rays and inverse scattering problems for obstacles	

Day 2: November 1st (Sunday Morning)			
Invited Lectures			
Time	**Speaker**	**Topic**	**Chair**
09:00-09:45	Zhifei Zhang (Peking University, China)	Linear inviscid damping and enhanced dissipation for shear flows	Changxing Miao (Beijing Institute of Technology, Beijing)
09:45-10:30	Ning Jiang (Wuhan University, China)	Self-organized system: modeling and analysis	
10:30-10:45	**Tea Break**		
10:45-11:30	François Nicoleau (Nantes Université, France)	On Uniqueness of Radial Potentials for Given Dirichlet Spectra with Distinct Angular Momenta	Takuya Watanabe (Ritsumeikan University, Japan)
11:30-12:15	Hiroyuki Chihara (University of the Ryukyus, Japan)	Normal operators of double fibration transforms	

Day 2: November 1st (Sunday Afternoon)			
Invited Lectures			
Time	**Speaker**	**Topic**	**Chair**
14:00-14:45	Frédéric Hérau (Nantes Université, France)	Hypocoercivity in cascade for linearized Boltzmann type equations with external potentials	Fucai Li (Nanjing University, China)
14:45-15:30	Zhiwu Lin (Fudan University, China)	Dissipation-induced instability and turning points in rotating stars	
15:30-15:45	**Tea Break**		
15:45-16:30	Daniel Han-Kwan (Nantes Université, France)	Semiclassical limit of the cubic nonlinear Schrödinger equation for mixed states	Jiang Xu (Nanjing University of Aeronautics and Astronautics, China)
16:30-17:15	Kai Yang (Southeast University, China)	Dynamics of nonlinear Schrödinger equation	

Day 3: November 2nd (Monday Morning)			
Invited Lectures			
Time	**Speaker**	**Topic**	**Chair**
09:00-09:45	Jiangong You (Nankai University, China)	Admissible Fourier Lengths, KAM Reducibility, and Spectral Application	Setsuro Fujiié (Ritsumeikan University, Japan)
09:45-10:30	Kouichi Taira (University of Tokyo, Japan)	Large eigenvalues and logarithmic Weyl law of the Connes-Moscovici operator	
10:30-10:45	**Tea Break**		
10:45-11:30	Zhongwei Shen (Westlake University, China)	The magnetic Laplacian in a bounded domain	Setsuro Fujiié (Ritsumeikan University, Japan)



ABSTRACT

A Poincaré-Steklov map for Dirac operators

Vincent Bruneau
University of Bordeaux, France

The main goal of the talk is to introduce a Poincaré-Steklov map for Dirac operators on smooth domains (an analogue for the Laplace operator is the Dirichlet-to-Neumann map). For MIT bag boundary conditions, we study the pseudodifferential properties of this map defined on the boundary and show that when the mass is large, it fits into the framework of the semiclassical analysis. This talk is based on a joint work with B. Benhellal and M. Zreik.

Semiclassical limit of the cubic nonlinear Schrödinger equation for mixed states

Daniel Han-Kwan
Nantes Université, France

We study the semiclassical limit of cubic NLS for mixed states. We justify the limit to a sin-gular Vlasov equation (namely Vlasov-Benney in the defocusing case), for data with finite Sobolev regularity that satisfy a Penrose stability condition. Joint work with F. Rousset (Université Par-is-Saclay).

Hypocoercivity in cascade for linearized Boltzmann type equations with external potentials

Frédéric Hérau
Nantes Université, France

In this talk we present results on the long time behavior of solutions of inhomogeneous linearized kinetic equations when the collision kernel has 5 conserved moments (mass, momentum and ener-gy). We study the case when there is an external potential acting on the system of particles. When there is no axisymetry or harmonicity of the potential, there is a unique equilibrium state (for a given initial mass and energy), and the return to the equilibrium is the result of a cascade of hypo-coercive and damping effects. When there are some axisymmetries or harmonicity properties of the potential, special solutions and conserved modes appear but the hypocoercivity scheme is also completed. We shall explain the general scheme of the proof and the main mathematical and physical ideas behind. This a joint work with K. Carrapatoso, J. Dolbeault, S. Mischler, C. Schmeiser and C. Mouhot.

Propagation of wave packets through a degenerate crossing in a model system

Kenta Higuchi
Gifu University, Japan

We study the propagation of wave packets in a semiclassical matrix-valued model in which two classical trajectories intersect with finite order of contact. Away from crossings, wave packets propagate along the corresponding classical trajectories. For transversal crossings, C. Fermani-an-Kammerer, C. Lasser and D. Robert have obtained an asymptotic description of the outgoing state as a sum of two wave packets. Their analysis is set in a general pseudodifferential framework allowing for several space dimensions and time-dependent Hamiltonians. In this talk, we focus on a one-dimensional model system of differential equations. We show that, after a tangential cross-ing, the component transferred to the other mode may no longer have the standard wave packet form. We introduce a class of generalized wave packets adapted to the resulting changes in spatial scale and phase, and use this class to describe the outgoing components asymptotically. This talk is based on joint work with V. Louatron (University of Copenhagen) and K. Taira (The University of Tokyo).

Normal operators of double fibration transforms

Chihara Hiroyuki
University of the Ryukyus, Japan

We study the structure of normal operators of double fibration transforms with conjugate points. Examples of double fibration transforms include Radon transforms, d-plane transforms on the Euclidean space, geodesic X-ray transforms, light-ray transforms, and ray transforms defined by null bicharacteristics associated with real principal type operators. We show that, under certain stable conditions on the distribution of conjugate points, the normal operator splits into an elliptic pseudodifferential operator and several Fourier integral operators, according to the degree of the conjugate points.

Spectral properties of higher-dimensional quantum walks

Hiroshi Isozaki
University of Tsukuba, Japan

Quantum walk (QW) aims at mathematical analysis of the spectrum of a group of unitary op-erators on a lattice and their spatial behavior. It has been receiving considerable attention from theoretical as well as applied sciences, such as quantum computing. Contrary to what their name might suggest, QWs are phenomena that should be regarded as quantum waves. In QW, one actu-ally studies spectral properties of unitary operators. As in the case of random walk, the behavior of diffusion is the main concern, however, QWs spread faster than random walks and their speed is studied by the velocity operator, which is a well-known subject in the scattering theory for self-adjoint operators. Although the mathematical properties of 1-dim. QWs are fairly well-understood, many problems concerning higher-dim. QWs remain unsolved. In this talk, we develop basic theory for higher-dim. QWs. Especially, the limiting absorption principle, com-pleteness of wave operators, eigenfunction expansion, Heisenberg's S-matrix and velocity opera-tors are main concern. This is a joint work with M. Lassas, S. Rautio (University of Helsinki) and J. Lu (University of Science and Technology of China).

Self-organized system: modeling and analysis

Ning Jiang
Wuhan University, China

In this talk we review some recent progress on the self-organized system, both in the scaling of particle system, kinetic and hydrodynamics. We investigate from the point view of both model-ing and rigorous analysis.

Dissipation-induced instability and turning points in rotating stars

Zhiwu Lin
Fudan University, China

Rotating stars provide a natural example in which dissipation can change the stability thresh-old. I will discuss axisymmetric stability of rigidly rotating stars 9for the free-boundary Na-vier-Stokes-Poisson system and compare it with the inviscid Euler-Poisson dynamics. For slowly rotating equilibria with fixed total angular momentum, we prove that the unstable index of the linearized viscous dynamics equals the Morse index of the constrained energy. This yields a turn-ing-point principle: viscous instability begins at the continuation of the first nondegenerate maxi-mum of the mass curve. The viscous and inviscid thresholds do not co-incide. In the inviscid prob-lem, the material distribution of specific angular momentum is conserved, whereas viscosity redis-tributes angular momentum while preserving only its total value. As a result, for every sufficiently small nonzero angular momentum, there is an interval beyond the viscous turning point where the viscous star is unstable while the corre-sponding inviscid star remains spectrally stable. A key in-gredient is an infinite-dimensional Kelvin-Tait-Chetaev theorem for damped gyroscopic systems with finite negative stiffness index, allowing an infinite-dimensional kernel and requiring neither compactness nor a spec-tral gap at zero.This is a joint work with Ming Chen and Yucong Wang.

Local well-posedness for the Boltzmann equation with hard potentials

Wei-Xi Li
Wuhan University, China

We consider the spatially inhomogeneous non-cutoff Boltzmann equation with hard po-tentials in the non-perturbative setting. For initial data with polynomial decay in the velocity variable, we establish the local-in-time existence and uniqueness of weak solutions, condi-tional to pointwise bounds on the hydrodynamic quantities (mass, energy, and entropy). Compared to the soft potential case, the key challenge for full-range hard potentials lies in the more severe loss of velocity mo-ments. The proof combines a hypoelliptic estimate with interpolation inequalities to handle the moment-loss terms.

On Uniqueness of Radial Potentials for Given Dirichlet Spectra with Distinct Angular Momenta

François Nicoleau
Nantes Université, France

We consider an inverse spectral problem for radial Schrödinger operators: to what extent can a radial potential be recovered from Dirichlet spectra corresponding to different angular momenta? We first prove a global uniqueness result when the spectra are known for infinitely many angular momenta satisfying a Müntz-type condition. We then turn to the more delicate question of whether only two angular momenta may suffice. Near the zero po-tential, we prove local uniqueness for the pairs (l1, l2)=(0,1), (1,2), (0,3). The proof combines an explicit analysis of the associated singular differential equation with the classical Knes-er-Sommerfeld formula. These results provide a local confirmation, for these three pairs, of a conjecture of Rundell and Sacks. Joint work with Damien Gobin, Benoît Grébert and Ber-nard Helffer (Nantes).

Multiscale analysis for twisted bilayer graphene

Francis Nier
Université Sorbonne Paris Nord, France

This is about a joint work with E. Cancès about the derivation of Bistritzer-MacDonald mod-els from a 3D more realistic quantum model. Although many theoretical tools were al-ready devel-oped in the 90's many specific problems with these physical system, force us to reconsider accu-rately those mathematical tools.

Multiple reflecting rays and inverse scattering problems for obstacles

Vesselin Petkov
University of Bordeaux, France

In his classical work "Can one hear the shape of a drum ?", (1966) Kac posed the problem to recover the shape of a strictly convex compact domain $D \subset \mathbb{R}^2$ from the spectrum $\{\lambda_j^2\}_{j=1}^{\infty}$ of the Laplacian $-\Delta$ with Dirichlet boundary condition on ∂D. The distribution $\sum_{j=1}^{\infty} \cos(\lambda_j t)$ is well defined and a Poisson relation says that its singularities are included in the set of the periods of periodic orbits in D. In this talk we study unbounded domains $\Omega = \mathbb{R}^d \setminus K$ and the problem to study is if the form of the obstacle K is uniquely determined by some scattering data. Consider the scattering kernel $s(t, \omega, \theta)$ which is the Fourier transform of the scattering amplitude related to K. First, we prove the Poisson relation which says that the singularities of scattering kernel with respect to t are included in the set of sojourn times of generalised rays in ω incoming with direction ω and outgoing with direction θ.. Second, we establish that for almost all directions (ω, θ) the Poisson relation becomes an equality. Thus the sojourn times are observables and they can be considered as scattering data. We discuss different inverse problems related to sojourn times. In particular, for a large class of obstacles the knowledge of the sojourn times for almost all directions determines uniquely the form of the obstacle. The results are obtained in joint works with L. Stoyanov.

The magnetic Laplacian in a bounded domain

Zhongwei Shen
WestLake University, China

This talk is concerned with the spectrum properties of the magnetic Laplacian with a higher-order vanishing magnetic field in a bounded domain. We are interested in the asymptotic behaviors of ground state energies for the Dirichlet Laplacian, the Neumann Laplacian, and the Dirichlet-to-Neumann operators, as the field strength parameter β goes to infinite. Assume the magnetic field does not vanish to infinite order, we establish the leading orders of β. We also obtain the first terms in the asymptotic expansions with remainder estimates under additional conditions.

Large eigenvalues and logarithmic Weyl law of the Connes-Moscovici operator

Kouichi Taira
University of Tokyo, Japan

The Bohr-Sommerfeld quantization condition is a principle that describes the semiclas-sical eigenvalues of a quantum system in terms of action integrals along closed trajectories of the cor-responding classical system. A refined quantization condition incorporating the Maslov index as a correction term was independently discovered by Keller and Maslov, and a mathematically rigor-ous framework was subsequently developed by Arnold and Hörman-der. On the other hand, for one-dimensional Sturm-Liouville systems under suitable bound-ary conditions, it may give rise to discrete eigenvalues even in situations where the usual Bohr-Sommerfeld picture based on closed classical trajectories does not directly apply. In this talk, we focus on the prolate operator recently introduced by Connes and Moscovici, and explain how eigenvalues arise when the corresponding classical system has no closed tra-jectories, as well as how these eigenvalues can be related to ac-tion integrals and Maslov index. As an application, we present a result concerning a Weyl law with a logarithmic term, conjectured by Connes and Moscovici, which describes the asymptotic behav-ior of the ei-genvalue counting function. This is a joint work with M.~Willems(Utrecht University) and M.~Wrochna (Utrecht University).

Dynamics of nonlinear Schrödinger equation

Kai Yang
Southeast University, China

We consider the Cauchy problem of the focusing energy-critical nonlinear Schrödinger equa-tion. We establish the blow-up/rigidity dichotomy for solutions on the energy level surface of the ground state. In the radial case, we removed the additional finite mass assumption proposed by Duyckaerts and Merle. In the non-radial case, we establish results under a finite-variance assump-tion or an explicit uniform bound on the kinetic energy. Further recent joint works will also be mentioned.

Admissible Fourier Lengths, KAM Reducibility, and Spectral Application

Jiangong You
Nankai University, China

We develop a perturbative KAM reducibility theory for one-frequency $SL(2,\mathbb{R})$ cocycles based on an admissible Fourier length l. The regularity relevant to the iteration is measured by positive adapted Fourier width rather than ordinary smoothness in the Euclidean Fourier variable |n|. The same length governs Fourier decay, truncation and resonance scales, and the arithmetic condition controlling the small divisors. This framework contains the classical analytic and Gevrey settings, while nonradial choices of l allow classical nowhere differentiable Weierstrass-type perturbations and continuous perturbations outside every positive Hölder class. As spectral applications, we obtain purely absolutely continuous spectrum for every phase and 1/2-Hölder continuity of the integrated density of states for the associated quasiperiodic Schrödinger operators. The Aubry dual has pure point spectrum for Lebesgue almost every dual phase, with eigenfunctions exponentially localized in the metric induced by l. We also construct nowhere differentiable quasiperiodic potentials with purely absolutely continuous Cantor spectrum.

Pointwise dispersive estimates for Schrödinger equation on manifolds with conical singularities

Junyong Zhang
Beijing Institute of Technology, China

In this talk, we will present recent results on pointwise dispersive estimates for Schrödinger equations on manifolds with conical singularities. We will discuss how the spectrum and the ge-ometry of the geodesic flow, particularly the phenomenon of focusing, influences the long-time decay of solutions. This talk is based on a series of joint papers with Q. Jia (Australian National University).

3-D anisotropic vs classical incompressible Navier-Stokes equations

Ping Zhang
Chinese Academy of Sciences, China

In this article, we begin by reviewing some classical results on the existence and regularity theory of the three-dimensional incompressible Navier-Stokes system (denoted by (NS)). We then present our results on the global well-posedness of the three-dimensional anisotropic Na-vier-Stokes system (ANS), which has dissipation only in the x1 and x2 directions. In the third part of this article, we establish regularity criteria and well-posedness results for the system (NS). We emphasize that the proofs of these results rely essentially on the anisotropic analysis developed in our study of (ANS). Finally, we present our results on lower bound estimates for the analyticity ra-dius of solutions to both (NS) and (ANS).

Linear inviscid damping and enhanced dissipation for shear flows

Zhifei Zhang
Peking University, China

Inviscid damping and enhanced dissipation are two important stabilizing mechanisms that play a crucial role in determining the transition threshold of laminar flows in the high-Reynolds-number regime. This lecture introduces several approaches to establishing inviscid damping and enhanced dissipation estimates for the linearized two-dimensional Navier-Stokes (Euler) equations around shear flows in a finite channel.

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