多复变函数论研讨会

（*Workshop on Several Complex Variables*）

2015 年 4 月 17 日-20 日

武汉大学

基金资助情况：

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本地组织委员会：

陈　化　武汉大学

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会议日程

注册时间：2015年4月17日

注册地点：丰颐大酒店

武昌区八一路336号 武汉大学附中旁边

4月17日晚，请与会者于18:00到丰颐大酒店二楼一起用餐

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大会日程表

	4 月 18 日	4 月 19 日	4 月 20 日
主席	**陈志华**	**刘太顺**	**欧阳才衡**
8：40－9：20	开幕式（8:40-9:05)	嵇庆春	吴瑞聪
9：25－9：50	关启安 (9:10-9:50)	张利友	颜启明
9：55－10：20	戎峰	钟春平	朱朗峰
10：20－10：50	**茶　歇**		
主席	**李庆忠**	**邱春晖**	**刘浩**
10：50－11：15	程晓亮	吕小芬	黄炎
11：20－11：45	江良英	张亮	尹万科
11：50－14：30	**午　餐（梅园餐厅）**		
主席	**任广斌**	**苏简兵**	
14：30－14：55	郝毅红	万东睿	
15：00－15：25	袁程	王煦	
15：25－15：55	**茶　歇**		
主席	**王伟**	**陈伯勇**	
15：55－16：20	吴飞凡	吴菊杰	
16：25－16：50	王海燕	王谢平	
16：55－17：20	戴济能	王磊	
17：40－19：00	**晚宴（珞珈山庄）**	**晚餐（丰颐酒店）**	

4 月 18 日		
主席：陈志华 （同济大学）		
8：40－9：05	开幕式	
9：10－9：50	关启安 北京大学	L^2 extension problem with sharp estimates and equality condition in Suita's conjecture
9：55－10：20	戎峰 上海交通大学	Quasi-Reinhardt domains and their automorphisms
10：20－10：50	**茶　歇**	
主席：李庆忠（首都师范大学）		
10：50－11：15	程晓亮 吉林师范大学	CR submanifolds in a sphere and their Gauss maps
11：20－11：45	江良英 上海金融学院	Essential Normality of automorphic composition operators
11：50－14：30	**午餐（梅园餐厅）**	
主席：任广斌（中国科技大学）		
14：30－14：55	郝毅红 中科院数学研究所	Canonical metrics on bounded pseudoconvex Hartogs domains and some applications
15：00－15：25	袁程 天津职业技术师范大学	Holomorphic Campanato spaces and a general family of function spaces
15：25－15：55	**茶　歇**	
主席：王伟（浙江大学）		
15：55－16：20	吴飞凡 浙江大学	On the Yamabe Problem on contact Riemannian Manifolds
16：25－16：50	王海燕 天津职业技术师范大学	Octonion Analysis of Several Variables
16：55－17：20	戴济能 武汉理工大学理学院	Composition operators induced by smooth self-maps of the unit ball
17：40－19：00	**晚宴（珞珈山庄）**	

4 月 19 日		
主席：刘太顺（湖州师范学院）		
8：40－9：20	嵇庆春 复旦大学	Solvability of the Dirac equation and geometric applications
9：25－9：50	张利友 首都师范大学	On the polarized Bergman metric and the curvature estimates
9：55－10：20	钟春平 厦门大学	On unitary invariant strongly pseudoconvex complex Finsler metric
10：20－10：50	**茶　歇**	
主席：邱春晖（厦门大学）		
10：50－11：15	吕小芬 湖州师范学院	Weakly Localized Operators on Fock Spaces with Application to Compactness
11：20－11：45	张亮 天津大学	subspace-hypercyclic and subspace-supercyclic operators
11：50－14：30	**午餐（梅园餐厅）**	
主席：苏简兵（江苏师范大学）		
14：30－14：55	万东睿 深圳大学	Viscosity solutions to quaternionic Monge-Ampere equations
15：00－15：25	王煦 复旦大学	Variation of Bergman kernels of pseudoconvex domains
15：25－15：55	**茶　歇**	
主席：陈伯勇（复旦大学）		
15：55－16：20	吴菊杰 复旦大学	Poincare Series And Very Ampleness Criterion For Pluri-Canonical Bundles
16：25－16：50	王谢平 中国科技大学	Julia theory for slice regular functions
16：55－17：20	王磊 武汉大学	Rigidity of proper holomorphic mappings between certain unbounded non-hyperbolic domains
17：40－19：00	**晚餐（丰颐大酒店）**	

4 月 20 日		
主席：欧阳才衡（中科院武汉物理与数学所）		
8：40－9：20	吴瑞聪 华东师范大学	Splitting holomorphic tangent sequence in locally Hermitian symmetric spaces
9：25－9：50	颜启明 同济大学	On the Relation between Nevanlinna Theory and Diophantine Approximation
9：55－10：20	朱朗峰 武汉大学	Optimal constants in L^2 extension theorems on weakly pseudoconvex Kahler manifolds
10：20－10：50	**茶 歇**	
主席：刘浩（河南大学）		
10：50－11：15	黄炎 河南大学	On translantion surfaces induced by billiards
11：20－11：45	尹万科 武汉大学	Some equivalence problems in several complex variables
11：50－14：30	**午餐（梅园餐厅）**	

报告人标题和摘要

2015年4月18日－20日

CR submanifolds in a sphere and their Gauss maps

程晓亮　吉林师范大学

Abstract: The relationship between CR submanifolds in a sphere and their Gauss maps are investigated. Let V be the image of a sphere by a rational holomorphic map F with degree two in another sphere. It is show that the Gauss map of V is degenerate if and only if F is linear fractional.

Composition operators induced by smooth self-maps of the unit ball

戴济能　武汉理工大学

Abstract: Let φ and ψ be holomorphic self-maps of the unit ball, which are sufficiently smooth on the sphere. We study the compact differences of composition operators induced by φ and ψ on the weighted Bergman space and Hardy space. The main result concerning φ and ψ with the same boundary data is a nontrivial generalization of the corresponding results in the case of one complex variable. It reveals the deep connection between the induced maps φ and ψ on the sphere. This is a joint work with Fangwen Deng and Caiheng Ouyang.

L^2 extension problem with sharp estimates and equality condition in Suita's conjecture

关启安　北京大学

Abstract: In this talk, we recall our general version of Ohsawa-Takegoshi L^2 extension theorem with sharp estimates. As an application, we skech our proof of the equality condition in Suita's conjecture. This is joint work with Professor Xiangyu Zhou.

Canonical metrics on bounded pseudoconvex Hartogs domains and some applications

郝毅红　中科院数学研究所

Abstract: On a bounded pseudoconvex Hartogs domain, there exists a natural complete Kaehler metric in terms of its defining function. In this talk, we will introduce our results on the following two problems. The first one is determining when this metric is Einstein or extremal. The second one is the existence of holomorphic isometric immersions of this domain into finite and infinite dimensional complex space forms.

ON TRANSLATION SURFACES INDUCED BY BILLIARDS

黄炎　河南大学

Abstract: The billiards in a rectangle with a barrier which is parameterized by a real number $\lambda \in (0,1)$ induce a one parameter family of translation surfaces $(X_\lambda, \omega_\lambda)$. In this paper, we show how the parameters and the given directions determine the properties of trajectories (minimal or closed). We also give a criterion to distinguish when two translation surfaces in $(X_\lambda, \omega_\lambda)$ belong to the same SL2(R)-orbit. Moreover, we calculate the Veech groups of $(X_\lambda, \omega_\lambda)$. Some related problems are also discussed.

Solvability of the Dirac equation and geometric applications

嵇庆春　复旦大学

Abstract: We study the Dirac equation by Hormander's L^2-method. By choosing appropriate weights, we get some geometric applications.

For Dirac bundles over 2-dimensional Riemannian manifolds, in compact case we give a sucient condition for the solvability of the Dirac equation in terms of a curvature integral; in noncompact case, we prove the Dirac equation is always solvable in weighted L2 space. As an application, we recover Hofer's Fredholm regular criteria of J-holomorphic curves in an almost complex manifold of dimension four.

On compact Riemannian manifolds, we give a new proof of Bar's theorem comparing the first eigenvalue of the Dirac operator with that of the Yamabe type operator.

On Riemannian manifolds with cylindrical ends, we obtain solvability in L2 space with suitable exponential weights allowing mild negativity of the curvature.

We also improve the above results when the Dirac bundle has a Z2-grading.

Essential Normality of automorphic composition operators

江良英　上海金融学院

Abstract: We first characterize those composition operators that are essentially normal on the weighted Bergman space $A^2_s(D)$ for any real $s > -1$, where induced symbols are automorphisms of the unit disk D. Using the same technique, we investigate automorphic composition operators on the Hardy space $H^2(B_N)$ and the weighted Bergman spaces $A^2_s(B_N)$ $(s > -1)$. Furthermore, we give some composition operators induced by linear fractional self-maps of the unit ball B_N that are not essentially normal.

Weakly Localized Operators on Fock Spaces with Application to Compactness

吕小芬　湖州师范学院

Abstract: Let F^p_φ be the Fock space induced by some weighted function φ satisfying $dd^c\varphi \simeq \omega_0$. In this paper, for $p \in (0,1]$ we introduce the concept of weakly localized operators on F^p_φ, which is shown to form a C^*-algebra under the F^p_φ operator norm. We characterize the compact operators in this C^*-algebra. As some application, for $0 < p < \infty$ we prove that an operator T in the closed algebra generated by bounded Toeplitz operators with BMO symbols is compact on F^p_φ if and only if its Berezin transform satisfies certain vanishing property at ∞ (or, $\lim_{z\to\infty} \widetilde{T}(z) = 0$ as $\varphi(z) = \frac{\alpha}{2}|z|^2$). And on the classical Fock space, we extend the Axler-Zheng's condition on linear operators T, which insures T is compact on F^p_α for all possible $0 < p < \infty$.

Quasi-Reinhardt domains and their automorphisms

戎锋　上海交通大学

Abstract: We first give the definition of a quasi-Reinhardt domain, and introduce the so-called resonance order and quasi-resonance order for such domains. We can then give a uniform upper bound for the origin-preserving automorphisms on bounded quasi-Reinhardt domains in terms of the quasi-resonance order. And as a particular consequence, we get that all origin-preserving automorphisms on bounded quasi-Reinhardt domains are linear if the resonance order is equal to one. This generalizes the classical Cartan's theorem for bounded circular domains. We also give a second proof of this linearity result, for which we show that bounded quasi-Reinhardt domains containing the origin with the resonance order equal to one are representative domains with the origin as the center. The first part is a joint work with Fusheng Deng.

Viscosity solutions to quaternionic Monge-Ampère equations

万东睿　深圳大学

Abstract: Quaternionic Monge-Ampère equations have recently been studied intensively using methods from pluripotential theory. We present an alternative approach using the viscosity methods. We study the viscosity solutions to the Dirichlet problem for quaternionic Monge-Ampère equations $det(f) = F(q, f)$ with boundary value $f = g$. Here Ω is a bounded domain in quaternionic space, g is a continuous function on the boundary of Ω, and $F(q,t)$ is a positive continuous function on $\Omega \times \mathbb{R}$ which is non-decreasing in the second variable. We prove a viscosity comparison principle and a solvability theorem. And the equivalence between viscosity and pluripotential solutions is showed. At the end of this talk, we present some pluripotential results by using the quaternionic closed positive currents.

Octonion Analysis of Several Variables

王海燕　天津职业技术师范大学

Abstract: The aim of this work is to extend the theory of sever al complex variables to the non - commutative and non - associative realm. Some basic results, such as the Bochner - Martinelli formul a, the existence theorem of the solutions to the non - homogeneous Cauchy - Riemann equations, and the Hartogs theorem, are generalized from complex analysis of several variables to o ctonion a nalysis of s everal v ariables . This work is joint with Professor Guangbin Ren.

Rigidity of proper holomorphic mappings between certain unbounded non-hyperbolic domains

王磊　武汉大学

Abstract: The Fock – Bargmann – Hartogs domain $D_{n,m}(\mu)$ $(\mu > 0)$ in C^{n+m} is defined by the inequality $\|w\|^2 < e^{-\mu\|z\|^2}$, where $(z, w) \in C^n \times C^m$, which is an unbounded non-hyperbolic domain in C^{n+m}. Recently, Yamamori gave an explicit formula for the Bergman kernel of the Fock – Bargmann – Hartogs domains in terms of the polylogarithm functions and Kim – Ninh – Yamamori determined the automorphism group of the domain $D_{n,m}(\mu)$. In this talk, I will talk about rigidity results on proper holomorphic mappings between two equidimensional Fock – Bargmann – Hartogs domains. This is a recent joint work with Zhenhan Tu.

Julia theory for slice regular functions

王谢平　中国科技大学

Abstract: The theory of slice regular functions is nowadays widely studied and has found elegant applications to functional calculus for quaternionic linear operators and Schur analysis. However, much less is known about their boundary behaviors. This talk will give an expository report on our study of Julia theory for slice regular functions. This is a joint work with Guangbin Ren.

Variation of Bergman kernels of pseudoconvex domains

王煦　复旦大学

Abstract: Inspired by Berndtsson's results, we shall give a variational formula of (derivatives of) the full Bergman kernels associated to a family of smoothly bounded strongly pseudoconvex domains. An equivalent criterion for the triviality of holomorphic motions in terms of the Bergman kernel is given as an application.

On the Yamabe Problem on contact Riemannian Manifolds

吴飞凡　浙江大学

Abstract: Contact Riemannian manifolds, whose complex structures are not necessarily integrable, are generalization of pseudohermitian manifolds in CR geometry. Tanaka-Webster-Tanno connection plays the role of Tanaka-Webster connection of a pseudohermitian manifold. Conformal transformations and the Yamabe problem are also defined naturally in this setting. By constructing the special frames and the normal coordinates on a contact Riemannian manifold, we prove that if the complex structure is not integrable, its Yamabe invariant on a contact Riemannian manifold is always less than the Yamabe invariant of the Heisenberg group. So the Yamabe problem on a contact Riemannian manifold is always solvable.

Poincare Series And Very Ampleness Criterion For Pluri-Canonical Bundles

吴菊杰　复旦大学

Abstract: Let X be a compact quotient of a bounded domain in C^n. Let K_X be the canonical line bundle of X. In this paper, we shall introduce the notion of S very ampleness for the pluri-canonical line bundles mK_X by using the Poincare series. The main result is an effctive Seshadri constant criterion of S very ampleness for mK_X.

Splitting holomorphic tangent sequence in locally Hermitian symmetric spaces

吴瑞聪　华东师范大学

Abstract: By pulling back the holomorphic tangent bundle of the ambient manifold and considering the normal bundle, a complex submanifold is naturally equipped with an exact sequence of holomorphic vector bundles, called the tangent sequence. A classical theorem of Van de Van states that a projective manifold whose tangent sequence splits in its ambient projective space must be a projective subpsace. In this talk, we are going to look at what happens if the ambient spaces are other locally Hermitian symmetric spaces.

On the Relation between Nevanlinna Theory and Diophantine Approximation

颜启明　同济大学

Abstract: Due to the work of Osgood, Lang, Vojta, etc., people have started to realize that there is a close relationship between Nevanlinna theory in complex analysis and Diophantine approximation. In this talk, we will give a brief introduction on the relation between these two theories.

Some equivalence problems in several complex variables

尹万科　武汉大学

Abstract: In this talk, I will give a brief introduction to the equivalence problems and normal form theories I had done in the past, as well as the problems I am interested in the further.

Holomorphic Campanato spaces and a general family of function spaces

袁程　天津职业技术师范大学

Abstract: In this talk, we present the Littlewood-Paley characterization of Campanato spaces and construct the relations between this space and a general family of function spaces $F(p, q, s)$. We also investigate the boundary value, Corona theorem, and interpolating sequences for a Moebius invariant general family of function spaces. Moreover, we introduce an integral operator preserving the Carleson measures and characterize the distance from the $F(p, q, s)$ spaces to the Bloch-type spaces.

ON THE POLARIZED BERGMAN METRIC AND THE CURVATURE ESTIMATES

张利友　首都师范大学

Abstract: In the present talk, we'll talk about the polarized Bergman metric and the Kähler-Einstein metric on bounded domains. Combine with some recent results by Lu , Fornaess and Wold, Deng, Guan and Zhang, Kim and Zhang, we give the curvature estimates, in terms of the defining functions, on bounded domains in $\mathbb{C}^n$.

subspace-hypercyclic and subspace-supercyclic operators

张亮　天津大学

Abstract: A bounded linear operator T on a Banach space X is called subspace-hypercyclic for a nonzero subspace M if $\mathrm{orb}(T, x) \cap M$ is dense in M for a vector x. Similarly, the bounded linear operator T on a Banach space X is called subspace-supercyclic for a nonzero subspace M if there exists a vector whose projective orbit intersects the subspace M in a relatively dense set. we will provide a subspace-supercyclicity criterion and offer two equivalent conditions of this criterion. At the same time, we also characterize other properties of subspace-supercyclic operators.

On unitary invariant strongly pseudoconvex complex Finsler metric

钟春平　厦门大学

Abstract: In this talk, I will give a characterization of unitary invariant strongly pseudoconvex complex Finsler metrics defined on unitary invariant domains in C^n, and prove that there is neither non-Hermitian complex Berwald metric nor Kaehler Finsler metric which is unitary invariant. I also show that there are many weakly complex Berwald metrics, and give a classification of weakly complex Berwald metrics which are constant holomorphic curvatures.

Optimal constants in L^2 extension theorems on weakly pseudoconvex Kähler manifolds

朱朗峰　武汉大学

Abstract: In this talk, we discuss the optimal constant problem in L^2 extension theorems of holomorphic sections of holomorphic line bundles with singular metrics on weakly pseudoconvex Kähler manifolds. Moreover, variable denominators and the corresponding optimal constants are involved in the final L^2 estimate.

与会人员名单

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