代数几何、复几何论文报告研讨会

我们计划在暑期7月20日-8月20日期间围绕代数几何和复几何共同关心的问题——extension理论报告Demailly，萧荫堂，Paun等人的重要文章，另外我们邀请了相关学者报告Fujita猜想和稳定性条件以及p-divisible group等专题。报告安排更新请关注http://staff.ustc.edu.cn/~zhlei18/

报告人：

Jun Li（李军，湖南大学）Singular Hermitian metric on holomorphic line bundle

（腾讯会议——时间：2020/7/22 20:00-23:00, ID：423 571 427；

第二次2020/7/27（周一） 09:00-11:30；ID：455 310 887 <https://meeting.tencent.com/s/BoeaURxJP8gt>）

Jiafu Ning（宁家福，中南大学）Hermitian metric on vector bundles

（腾讯会议——时间：2020/7/29 09:00-11:30（周三） ID：711 562 294链接 https://meeting.tencent.com/s/oc33hO09JCGm）

Hao Sun（孙浩，上海师范大学）Stability condition and Fujita conjecture（腾讯会议——时间：2020/7/31（周五） 09:00-11:30；ID：960 243 616 链接：https://meeting.tencent.com/s/Rk6nSJtWIcjf）

Zhan Li（李展，南方科技大学）Extension Theorem （待定）

Chuyu Zhou（周楚宇，待业-EPFL）Positivity of CM bundle （待定）

Zhiwei Wang（汪志威，北京师范大学）An outline of OT extension（待定）

Chen Zhao（赵晨，中国科学技术大学）Invariance of plurigenera（待定）

Songyan Xie（谢松晏，中国科学院数学与系统科学研究院）Demailly, Angehrn-Siu’s approach to Fujita conjecture（待定）

Jiangwei Xue（薛江维，武汉大学）p-divisble group（待定）

报告内容：

Zhan Li（李展，南方科技大学）

Reference:

[DHP13] Extension theorems, non-vanishing and the existence of good minimal models

Abstract: It is shown that the abundance conjecture is implied by the non-vanishing conjecture and an extension conjecture. A special case of the above extension conjecture is proved.

Chuyu Zhou（周楚宇，待业-EPFL）

Reference:

[CP8] Codogni and Patakfalvi, Projectivity of CM line bundle for families of K-stable klt Fanos.

[Pos19]: Patakfalvi , Positivity of CM line bundle for K-stable log Fanos.

[XZ19]: Xu-Zhuang, On projectivity of the CM line bundle on K-moduli sopaces.

Abstract: I will talk about the positivity of Chow-Mumford line bundle under the assumption of some K-stable condition for Fano varieties. Specially, I will explain the key ideas and some techniques in works [CP18], [Pos19],[XZ19].

Zhiwei Wang（汪志威，北京师范大学）

Abstract: A bird-view of Ohsawa-Takegoshi extension.

Jun Li（李军，湖南大学）

Title: Singular Hermitian metric on holomorphic line bundle

Abstract: For a singular Hermitian metric on holomorphic line bundle :

1. The curvature form of a singular Hermtian metric is well de\_ned in the sense of current.

(2) A line bundle is pseudo-effective if and only if it admits a positive sigular Hermitian metric.

(3) We can associate a multiplier ideal sheaf to a positive singular Hermitian metric

(4) We can prove Nadel type vanishing theorem.

These facts and related techniques are important to study global generation problems for (adjoint ) line bundles. I will report on the following papers which try to establish these facts in the setting of vector bundles.

References:

1. de Cataldo, Singular Hermitian metrics on vector bundles, J. Reine Angew. Math 1998
2. J. P. Demailly, T. Peternell, M. Schneider, Pseudo-effective line bundles on compact Kahler manifolds. International Journal of Mathematics. 2001
3. H. Raufi, Singular Hermitian metrics on holomorphic vector bundles, Ark. Mat. 2015
4. Richard Larkang, Hossein Raufi, Jean Ruppenthal, Martin Sera, Chern forms of singular metrics on vector bundles, Advances in Mathematics 2018

Jiafu Ning（宁家福，中南大学）

Abstract: We study the positivity properties of Hermitian (or even Finsler) holomorphic vector bundles in terms of L p -estimates of ∂ and L p -extensions of holomorphic objects. To this end, we introduce four conditions, called the optimal L p -estimate condition, the multiple coarse L p -estimate condition, the optimal L p -extension condition, and the multiple coarse L p -extension condition, for a Hermitian (or Finsler) vector bundle (E,h). The main result of the present paper is to give a characterization of the Nakano positivity of (E,h) via the optimal L 2 -estimate condition.

Chen Zhao（赵晨，中国科学技术大学）

Reference：

Yum-Tong Siu, Invariance of plurigenera and torsion-freeness of direct image sheaves of pluricanonial bundles.

Muhai Paun: A One-Tower proof of Siu’s invariance of plurigenera

Abstract: The deformational invariance of plurigenera proved recently by the author is a special case of the torsion-free property of the first direct image sheaf of the pluricanonical line bundle when the target space of the proper surjective holomorphic map is the open unit 1-disk with nonsingular fibers. This article discusses the adaptation of the techniques used in the proof of the deformational invariance of plurigenera to the general problem of proving the torsion-free property of the first direct image sheaf of the pluricanonical line bundle. The discussion covers also the more general case of the torsion-free property of the first direct image of the pluricanonical line bundle after twisting by a Hermitian holomorphic line bundle with semipositive curvature current and by its multiplier ideal sheaf. A number of results are obtained for the torsion-free problems by the adaptation of the techniques of the proof of the deformational invariance of plurigenera.

Hao Sun（孙浩，上海师范大学）

 Reference:

Bayer, Arend; Bertram, Aaron; Macrì, Emanuele; Toda, Yukinobu Bridgeland stability conditions of threefolds II: An application to Fujita's conjecture. J. Algebraic Geom. 23 (2014),no. 4, 693–710.

Abstract: We apply a conjectured inequality on third chern classes of stable two-term complexes on threefolds to Fujita's conjecture. More precisely, the inequality is shown to imply a Reider-type theorem in dimension three which in turn implies that K + 6L is very ample when L is ample, and that 5L is very ample when K is trivial.

Jiangwei Xue（薛江维，武汉大学）

Abstract: This is a preliminary introduction to p-divisible groups over perfect fields of characteristic p>0. We will review some basic facts about formal groups, define p-divisible groups, and then focus on the Dieudonné theory and its application in the classification of p-divisible groups.

References:

[1] Demazure, Lectures on p-divisible groups, LNM302

[2] Edixhoven, van der Geer, Moonen, Abelian varieties, Ch15, Dieudonné theory <http://gerard.vdgeer.net/AV.pdf>

[3] S.S. Shatz, Group Schemes, Formal Groups, and p-divisible groups, In: Arithmetic Geometry ed. Cornell and Silverman.

Songyan Xie（谢松晏，中国科学院晨兴数学研究中心）

Abstract: Fujita conjecture predicts that, for an ample line bundle L over a compact complex manifold X of dimension n, K\_X+mL should be globally generated (resp. very ample) for m>n (resp. m>n+1). We will report the classical results of Demailly, Angehrn-Siu, Siu in this direction.

Reference:

1. Demailly, Méthodes L2 et résultats effectifs en géométrie algébrique, Astérisque, tome 266 (2000), Séminaire Bourbaki, exp. no 852, p. 59-90

2. Angehrn-Siu, Effective freeness and point separation for adjoint bundles, Invent. math. 122, 291-308 (1995)