

Speaker: Koeun Choi (Korea U)

Title: Difference of Weighted composition operators

Abstract: We obtain complete characterizations in terms of Carleson measures for bounded/compact differences of weighted composition operators acting on the standard weighted Bergman spaces over the unit disk. Unlike the known results, we allow the weight functions to be non-holomorphic and unbounded. As a consequence we obtain a compactness characterization for differences of unweighted composition operators acting on the Hardy spaces in terms of Carleson measures and, as a nontrivial application of this, we show that compact differences of composition operators with univalent symbols on the Hardy spaces are exactly the same as those on the weighted Bergman spaces. This is joint work with B. R. Choe, H. Koo and J. Yang.

References

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Speaker: Jeongmin Ha (PNU)

Title: CHARACTERIZATIONS ON ENTIRE FUNCTION SPACES WITH FOCK-TYPE NORM

ABSTRACT. In this talk, we prove that the norm of the radial derivative $\mathcal{R}f$ of an entire function f with respect to Gaussian type measure $e^{-\phi(|z|)} dv$ is equivalent to the norm of f supplemented with $|z|\phi'(|z|)$. This norm equivalence is called the Sobolev norm equivalence for $\|\cdot\|_{p,q,\phi}$ where

$$\|f\|_{p,q,\phi} = \left(\int_0^\infty M_q^p(r, f) r^{2n-1} e^{-p\phi(r)} dr \right)^{1/p} < \infty,$$

and $M_q(r, f) = \left[\int_{\mathbb{S}_n} |f(r\zeta)|^q dS(\zeta) \right]^{1/q}$ for $0 < p, q < \infty$.

In addition, we obtain that the norm of an entire function f with respect to Gaussian type measure $e^{-\phi(|z|)} dv$ is equivalent to the norm of the radial derivative $\mathcal{R}f$ multiplied by the distortion function from the weight function $\phi(|z|)$. Then a class of weights satisfying this norm equivalence contains a function $\phi(|z|) = \alpha|z|^m + \frac{t}{p} \ln(1 + |z|)$ where $\alpha > 0$, $t \in \mathbb{R}$, and $m \in \mathbb{N}$. We have that Lipschitz type characterization and double integral characterization for Fock-type spaces with the norm

$$\|f\|_{F_{m,\alpha,t}^p}^p = \int_{\mathbb{C}^n} |f(z)e^{-\alpha|z|^m}|^p \frac{dv(z)}{(1 + |z|)^t}.$$

These characterizations are the extensions of the classical weighted Fock space $F_{2,\alpha,t}^p$. Moreover, the Lipschitz type characterization is proved on Fock-type spaces with general weights.

References

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Speaker: Hyunil Choi (PNU)

Title: ON A EXPLICIT KERNELS FOR WEIGHTED FOCK SPACES AND THEIR BERGMAN METRIC

Abstract:

Let $s > 0$. We can compute explicitly for reproducing kernels of weighted Fock spaces F_s^2 of positive order s (see [2, 3]). In this talk we consider reproducing kernels for weighted Fock spaces F_{-s}^2 of negative order $-s$. Contrast to the positive order case, we can not compute explicit reproducing kernels for weighted Fock spaces F_{-s}^2 . So, we introduce new weighted Fock spaces \tilde{F}_{-s}^2 and their explicit reproducing kernels. We will also discuss that reproducing kernels for \tilde{F}_{-s}^2 satisfy some conditions in Klembeck's paper [4]. This is joint work with H. R. Cho and H.-W. Lee.

References

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Speaker: Seungjae Lee (Postech)

Title: An Extension theorem of holomorphic functions on hyperconvex domains.

Abstract: Let $n \geq 3$ and Ω be a bounded domain in \mathbb{C}^n with a smooth negative plurisubharmonic exhaustion function φ . As a generalization of Y. Tiba's result, we prove that any holomorphic function on a connected open neighborhood of the support of $(i\partial\bar{\partial}\varphi)^{n-2}$ in Ω can be extended to the whole domain Ω . To prove it, we combine an L^2 version of Serre duality and Donnelly-Fefferman type estimates on $(n, n-1)$ - and (n, n) - forms.

References

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Speaker: Kwok Kin Wong (KIAS)

Title: Existence of symmetric differentials on hyperbolic space forms

Abstract: Let $X = \mathbb{B}^n / \Gamma$ be a torsion-free noncompact quotient of complex unit ball of finite volume. On the Mumford compactification \overline{X} of X , we consider the problem of constructing symmetric differentials vanishing at infinity. We view this as a generalization of the construction of cusps forms of modular curves. If time permits, we will discuss its connection to hyperbolicity problems and further directions.

Speaker: Sungmin Yoo (KIAS)

Title: Variation of Kahler-Einstein metrics on strictly pseudoconvex domains in Kahler manifolds

Abstract: In [1], Schumacher showed that the variation of Kahler-Einstein metrics on canonically polarized compact complex manifolds is positive. Later, the variation of Kahler-Einstein metrics on strictly pseudoconvex domains in C^n was studied by Young-Jun Choi in [2,3], when the variation is given by the canonical projection map from C^{n+m} to C^n .

In this talk, we will study the variation of Kahler-Einstein metrics on strictly pseudoconvex domains in Kahler manifolds, when the variation is given by a holomorphic submersion map between two complex manifolds. We will also discuss the extension of the variation across singular fibers, using the argument of Paun in [4]. This is joint work with Young-Jun Choi from Pusan National University.

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Speaker: Jihun Yum (Postech)

Title: Diederich-Fornaess index and Steinness index

Abstract: Let Ω be a smooth bounded pseudoconvex domain in C^n . The Diederich-Fornaess index and the Steinness index of Ω are defined by

$$DF(\Omega) := \sup_{\rho} \{0 < \eta < 1 : -(-\rho)^\eta \text{ is strictly plurisubharmonic on } \Omega\},$$

$$S(\Omega) := \inf_{\rho} \{\eta > 1 : \rho^\eta \text{ is strictly plurisubharmonic on } \Omega^C \cap U\}$$

for some neighborhood U of $\partial\Omega$,

We will first see basic properties of $DF(\Omega)$ and $S(\Omega)$. And then we investigate the relation between the Diederich-Fornaess index and the Steinness index on worm domains.

References

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<https://doi.org/10.1007/s12220-018-0053-z> (2018)

Speaker: Hoseob Seo (SNU)

Title: Jumping numbers of analytic multiplier ideals

Abstract: We study jumping numbers of analytic multiplier ideals, extending the previous work in the algebraic case of Ein-Lazarsfeld-Smith-Varolin [ELSV] to general plurisubharmonic functions. As shown recently by an example of Guan and Li, the jumping numbers can have a cluster point in the plurisubharmonic case. We give another such plurisubharmonic example based on a graded system of ideals from [ELSV]. In view of this second example, we show that if there is one cluster point of jumping numbers, then there should be infinitely many cluster points, for toric plurisubharmonic functions. This provides further information on the example of Guan and Li. In an appendix by S. Boucksom, it is shown that given a graded system of ideals, the algebraically defined asymptotic multiplier ideals are equal to the analytic multiplier ideals of Siu psh functions, which is used to establish the aforementioned example. This is joint work with Dano Kim.