Measuring singularities of plurisubharmonic functions against Monge–Ampère measures

Özcan Yazıcı
(METU)

A plurisubharmonic (psh) function on $\mathbb{C}^n$ may tend to $-\infty$ at a point, and a basic question is how severe this pole is. Two classical numerical gauges are the Lelong number and the integrability exponent: the supremum of c for which $e^{-2c\varphi}$ is integrable near the point. Skoda's theorem and the sharp lower bound of Demailly and Phạm, expressed through the intersection numbers of φ, relate the two.

In this talk I will explain these notions from scratch then change the ruler: instead of Lebesgue measure we integrate against a complex Monge–Ampère measure $(dd^c u)^n$ with an α-Hölder continuous potential u. Such measures can concentrate mass much more than area, so the integrability threshold shifts. I will present a recent lower bound for the resulting α-Hölder integrability exponent, which improves a previous estimate of Kaufmann, and a sharp bound for toric psh functions.

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