İSTANBUL ANALYSIS SEMINARS

LU QI-KENG PROBLEM

Tomasz BEBEROK

University of Agriculture in Kraków
Department of Applied Mathematics
&
Sabancı University *(visiting)*
Faculty of Engineering and Natural Sciences

Abstract: Lu Qi-Keng conjecture comes as a problem in Lu's paper "On Kähler manifolds with constant curvature." That paper was written in Chinese and was published in *Acta Math. Sinica* **16** (1966), 269–281, which was the last one before the culture revolution. Fortunately the paper was chosen to be translated in English and was published in *Chinese Math.-Acta* **8** (1966), 283–298, so that it has become known in the world.

Zeros of the Bergman kernel function evidently pose an obstruction to the global definition of Bergman representative coordinates. This observation was Lu Qi-Keng's motivation for asking which domains have zero-free Bergman kernel functions. That problem was called Lu Qi-Keng conjecture firstly in 1969 by M. Skwarczyński in his paper "The invariant distance in the theory of pseudoconformal transformations and the Lu Qi-Keng conjecture." Since then, there are many mathematicians working on the Lu Qi-Keng problem.

In the first part I will talk about the Bergman kernel function (definition, basic properties and explicit formulas in some special cases). Then I will talk about the motivation for Lu Qi-Keng conjecture and the results about the presence or absence of zeros of the Bergman kernel function of a bounded domain in $\mathbb{C}^n$. In the last part of my talk I will show that the intersection of two Lu Qi-Keng domains is not necessarily a Lu Qi-Keng domain.

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Bankalar Caddesi 2, Karaköy 34420, İstanbul