SCMS Seminar

FROM DVORETRZKY RANDOM COVERING TO DYNAMICAL DIOPHANTINE APPROXIMATION

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Time: 16:00 p.m.-17:00 p.m., Monday, June 13, 2016
Venue: Room 2201, East Guanghua Tower (Main), Fudan University

Abstract: Let (ω_n) be a sequence of i.i.d. random variables uniformly distributed on the circle $\mathbb{T}$ (of circumference 1) and (ℓ_n) be a (decreasing) sequence of positive numbers smaller than 1. Then we have a sequence of random intervals (I_n) on $\mathbb{T}$ having (ω_n) as centers and (ℓ_n) as lengths. Under what condition on (ℓ_n), is almost surely the whole circle $\mathbb{T}$ covered by $I_n's$? This is the Dvoretzky random covering problem arised in 1956. I will give a chronological presentation of works done on the subject, including thoses of J.P. Kahane, B. Mandelbrot, P. Billard, P. Erd\"{o}s, S. Orey, L. Shepp, A. H. Fan, J. Barral et al. If the centers ω_n are replaced by an orbit of a dynamical system, the corresponding problem is qualified Dynamical Diophantine Approximation. One of the first interesting hyperbolic dynamical system is the doubling map $Tx = 2 x \mod 1$ and Gibbs measures play the role of probability measure. This case was studied by A. H. Fan, J. Schmeling and S. Troubetzkoy and new phenomena occur in this case of non-independence. In both cases, we found multifractal behaviors.