Weak and strong moments of random vectors

Rafał Latała

University of Warsaw
Warsaw, Poland

We will present several results and open questions related to the comparison of weak and strong moments of random vectors. In particular we will discuss the following two problems.

1. Let X and Y be random vectors taking values in a normed space such that $E|\varphi(X)|^p \leqslant E|\varphi(Y)|^p$ for all linear functionals φ and $p \geqslant 1$. What regularity assumptions on the distributions of X and Y are then sufficient to imply $E\|X\| \leqslant CE\|Y\|$ or more general $(E\|X\|^p)^{1/p} \leqslant C(E\|Y\|^p)^{1/p}$ for $p \geqslant 1$?

2. For which random vectors X,

$$(E\|X\|^p)^{1/p} \leqslant C\Big(E\|X\| + \sup_{\|\varphi\|_* \leqslant 1} \big(E|\varphi(X)|^p\big)^{1/p}\Big)$$

for all $p \geqslant 1$?

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