Measure Concentration for Stable Laws with Index Close to 2

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Abstract

We give upper bounds for the probability $P(|f(X)-Ef(X)|>x)$, where X is a stable random variable with index close to 2 and f is a Lipschitz function. While the optimal upper bound is known to be of order $1/x^alpha$ for large x, we establish, for smaller x, an upper bound of order $exp(-x^alpha/2)$, which relates the result to the gaussian concentration.

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Pages: 29-35

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Bibliography

1. C. Borell. The Brunn--Minkowski inequality in Gauss space. *Invent. Math.* 30 (1975), 207-216. Math. Review 0399402
2. C. Houdr'e. Remarks on deviation inequalities for functions of infinitely divisible random vectors. *Ann. Proba.* 30 (2002), 1223-1237. Math. Review 1920106
3. C. Houdr'e, P. Marchal. On the Concentration of Measure Phenomenon for Stable and Related Random Vectors. *Ann. Proba.* 32 (2004), 1496-1508. Math. Review 2060306
4. C. Houdr'e, P. Reynaud. Concentration for infinitely divisible vectors with independent components. *Preprint* (2004).
5. K-I. Sato. *L'evy processes and infinitely divisible distributions.* Cambridge Studies in Advanced Mathematics 68 (1999) Cambridge University Press. Math. Review 1739520
6. V.N. Sudakov and B.S.~Tsirel'son. Extremal properties of half--spaces for spherically invariant measures. *Zap. Nauch. Sem. LOMI* 41 (1974), 14-24. English translation in: *J. Soviet Math.* 9 (1978), 9-18. Math. Review 0365680
7. M. Talagrand. A new isoperimetric inequality for product measure, and the concentration of measure phenomenon. *Israel Seminar* Lecture Notes in math. 1469 (1989), 91-124. Math. Review 1122615

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