



PLENARY LECTURES

On the tradeoff between rates of almost sure convergence and overshoot integrability

Michael A. Högele*

Universidad de los Andes - Colombia.

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11h - 12h

FT - Auditorium

Abstract.

In this talk we start with an elementary, but useful, quantitative generalization of the first Borel-Cantelli lemma. The idea is to translate good rate of convergence of probability events into higher order moments of the overlap statistics.

That is, it can quantify almost sure convergence in terms of the number of occurrences of the error events, which appear in the convergence in probability. We provide a sample of applications, such as the strong law of large numbers, the presence of a large deviations principle, the method of moments in statistics and numerical analysis. In the end we present results on martingale convergence, such as the convergence of Polya urns. This is joint work with Luisa F. Estrada and A. Steinicke in [1, 2, 3].

*E-mail: ma.hoegele@uniandes.edu.co

References

- [1] Estrada, L.F., Högele, M.A: Moment estimates in the first Borel-Cantelli Lemma with applications to mean deviation frequencies, *Statistics and Probability Letters* 190, (2022), 109636. <https://doi.org/10.1016/j.spl.2022.109636>
- [2] Högele, M.A., Steinicke, A.: Deviation frequencies of Brownian path property approximations. (preprint) <https://arxiv.org/abs/2302.04115>
- [3] Estrada, L.F., Högele, M.A, Steinicke, A.: On the tradeoff between almost sure error tolerance versus mean deviation frequency in martingale convergence (preprint) <https://arxiv.org/abs/2310.09055>