Pathwise stochastic integration and invariance with respect to the choice of the partition sequence

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In this talk, we present a pathwise approach to stochastic integration: Using the concepts of quadratic variation and Lévy area of a continuous path along a sequence of time partitions, we construct a pathwise integral as a limit of general Riemann sums. In a probabilistic framework, when the underlying process is a semimartingale, this notion of integration is consistent with stochastic integration. Furthermore, we give necessary and sufficient conditions for the quadratic variation and Lévy area of a continuous path to be invariant with respect to the choice of the partition sequence.

References:

[1] Purba Das, Anna P. Kwossek, and David J. Prömel: A rough path approach to pathwise stochastic integration à la Föllmer, *arXiv preprint arXiv:2507.17363*, 2025.