

Martingale and classical harmonic analysis in non-homogeneous settings

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Abstract

The harmonic analysis on martingales was developed in parallel with the classical harmonic analysis, with most of the classical objects like Hardy spaces, BMO, etc having their martingale analogues. Due to better localization properties martingale objects are usually easier to investigate, so the martingale harmonic analysis can be a very powerful tool for the classical problems.

I will be discussing some well known and some new results in the martingale harmonic analysis, as well as the ways of transferring martingale results to the classical settings. I will mostly deal with the problems related to the non-homogeneous harmonic analysis, i.e. to the situation when the underlying measure lacks doubling. While some results I will be discussing are well known, the other are new, and one might say unexpected.