

**ON THE KHINTCHINE AND ROSENTHAL INEQUALITIES IN
NONCOMMUTATIVE SYMMETRIC SPACES**

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ABSTRACT

Probabilistic inequalities for independent random variables and martingales play a prominent role in many different areas of mathematical research, such as harmonic analysis, probability theory, Banach space geometry and the study of symmetric function spaces. In the recent years, many of these classical probabilistic inequalities have been generalized to the context of noncommutative L_p -spaces. In the context of operator algebras, these inequalities are equally fundamental for the study of the geometry of noncommutative L_p -spaces, free probability theory and noncommutative harmonic analysis. In this talk, we describe various extensions of these inequalities to the realm of noncommutative symmetric Banach function spaces. Our attention is focused on generalizing some classical inequalities for independent random variables, due to H.P. Rosenthal. The latter inequalities can be viewed as generalizations of classical Khintchine inequalities and we shall expound this connection and describe some recent developments in the area of noncommutative Khintchine inequalities as well. Joint work with S. Dirksen, D. Potapov and B. de Pagter.