


复旦大学数学科学学院
数学综合报告会

报告题目：Orthogonal expansions with exotic parameter values

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摘要：Classical settings of discrete and continuous orthogonal expansions, like Laguerre, Jacobi and Bessel are associated with second order differential operators playing the role of the Laplacian. They depend on certain parameters which are usually restricted to a half-line, or to a product of half-lines if higher dimensions are considered. Following earlier research done by Hajmirzaahmad, we deal in this paper with Laplacians in the above-mentioned contexts with no restrictions on the parameters, and exhibit naturally associated orthogonal systems that in fact involve the classical ones, but are different and therefore called exotic. This reveals new frameworks related to classical orthogonal expansions and thus new settings for harmonic analysis. We focus on maximal operators of multi-dimensional Laguerre and Bessel semigroups with arbitrary parameter values, and prove that they satisfy weak type $(1,1)$ estimates with respect to the appropriate measures. In general, these measures are not finite, which makes a contrast with the classical situation and causes new difficulties.

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