

EXOTIC SEMIGROUPS ASSOCIATED WITH CLASSICAL ORTHOGONAL EXPANSIONS AND THEIR MAXIMAL OPERATORS

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Classical settings of continuous and discrete orthogonal expansions, like Bessel, Laguerre and Jacobi, are associated with second order differential operators playing the roles of Laplacians. The latter depend on certain parameters of type that are restricted commonly to a half-line, or a product of half-lines if higher dimensions are considered.

Following some known results, we deal with Laplacians in the above mentioned contexts with no restrictions on the type parameters and bring to attention naturally associated orthogonal systems that in fact involve the classical ones, but are different. This reveals new frameworks related to classical orthogonal expansions and thus new potentially rich research area, at least from harmonic analysis perspective.

To provide support to the last claim we focus on maximal operators of multi-dimensional Bessel, Laguerre and Jacobi semigroups, with unrestricted type parameters, and prove that they satisfy weak type $(1, 1)$ estimates with respect to appropriate measures. Generally, these measures are not locally finite, which makes a contrast with the classical situations and generates new difficulties.

This is joint work with Peter Sjögren and Tomasz Z. Szarek.

REFERENCES

- [1] A. Nowak, P. Sjögren, T. Z. Szarek, *Maximal operators of exotic and non-exotic Laguerre and other semigroups associated with classical orthogonal expansions*. [arXiv:1607.00979](https://arxiv.org/abs/1607.00979)