

FAKULTÄT FÜR MATHEMATIK Univ.-Prof. Dr. Radu Ioan Bot, Privatdoz.

Einladung zur öffentlichen Defensio von

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Thema der Dissertation

Reproducing systems arising from unitary representations and functional expansions

Abstract:

The thesis consists of seven papers in the field of harmonic analysis. The main object of study are reproducing systems that arise from actions of unitary group representations. A particular focus is on criteria for the existence of such systems forming a frame or Riesz sequence in the representation space and their universality, the ability to yield functional expansions in families of associated Banach function spaces. In particular, new criteria are obtained under which the canonical Hilbert frame expansions extend to other functional spaces for shift-invariant systems with varying lattices, as well as for coherent systems arising from square-integrable representations. In both settings, these results improve existing decomposition theories, which only provide a particular dual system with suitable properties. Also new criteria that are optimal in the Hilbert space setting are obtained for particular classes of reproducing systems. Among others, these results contain snug frame bound estimates for non-dyadic wavelets, a density theorem for lattice orbits of discrete series representations forming a Riesz sequence, and strict density inequalities for smooth coherent systems on homogeneous Lie groups.

Prüfungssenat:

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