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Quantum Fractional Integral Operators in the Quantum Morrey Spaces

In this talk, we focus on the boundedness properties of certain integral operators including the quantum Hardy-Littlewood maximal operator ${}_qM$ and quantum fractional integral operator (or quantum Riesz potential operator) ${}_qI_\alpha$ within the framework of quantum Lebesgue and quantum Morrey spaces $L_p(R, d_q)$ and $L_{p,\lambda}(R, d_q)$, respectively, where $0 < q < 1, 1 \leq p < \infty, 0 \leq \lambda \leq 1$. Building on recent developments in q-calculus and quantum analysis, the study aims to extend classical results on quantum integral inequalities to the quantum Lebesgue and quantum Morrey setting using geometric characterization of balls in the quantum measure space (R, d_q). Expected outcomes include the developments of new boundedness theorems and are anticipated to contribute significantly to the field of quantum harmonic analysis and its applications to mathematical physics, especially quantum mechanics.

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