THE POWER QUANTUM CALCULUS
AND VARIATIONAL PROBLEMS

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Abstract. We introduce the power difference calculus based on the operator $D_{n,q}f(t) = \frac{f(q^n t) - f(t)}{q^n - 1}$, where $n$ is an odd positive integer and $0 < q < 1$. Properties of the new operator and its inverse — the $d_{n,q}$ integral — are proved. As an application, we consider power quantum Lagrangian systems and corresponding $n,q$-Euler–Lagrange equations.

Keywords. Quantum variational problems; $n,q$-power difference operator; generalized Nörlund sum; generalized Jackson integral; $n,q$-difference equations.

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References


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