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**ON THE INTERACTION BETWEEN SYSTEMS OF
PDE, q -DIFFERENCE EQUATIONS, MULTIPLE
 q -HYPERGEOMETRIC SERIES AND THE q -LAPLACE
TRANSFORM**

The well-known multiple hypergeometric series are all solutions to canonical systems of partial differential equations, which can be written in many forms. For the q -case, the canonical systems of partial q -difference equations have corresponding solutions multiple q -hypergeometric series [1]. These solutions are only valid near the origin and can be extended by analytic and meromorphic continuation. In order to explain the extended convergence regions for these multiple q -hypergeometric series, which consist of a rhombus and an octahedron [2], etc. we have to introduce so-called q -real numbers [3]. Finally, we shall introduce a new q -Laplace transform for a Jackson q -integral $\int_0^a f(t, q) d_q(t)$, with upper integration limit $\frac{1}{s(1-q)}$.

We shall conclude with a list of q -Laplace transforms for (multiple) q -hypergeometric series, some with function arguments so-called q -real numbers.

REFERENCES

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- [2] Ernst, T., Convergence aspects for q -Appell functions I. J. Indian Math. Soc., New Ser. **81**(1-2), 67-77 (2014)
- [3] Ernst, T. *Three algebraic number systems based on the q -addition with applications*, Ann. Univ. Marie Curie, Sect. A **75** (2), 45-71 (2021)