FRACTIONAL q-CALCULUS AND CERTAIN SUBCLASSES OF UNIVALENT ANALYTIC FUNCTIONS

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Abstract. By applying the concept (and theory) of fractional q-calculus, we first define and introduce new classes of univalent functions analytic in the open unit disk involving a q-differeintegral operator. Among the results investigated for these function classes are the coefficient inequalities and distortion theorems. Special cases are briefly pointed out.

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Key words. analytic functions, univalent functions, fractional q-calculus operators, coefficient bounds and distortion theorems.

REFERENCES

[1] ABU-RISHA, M.H., ANNABY, M.H., ISMAIL, M.E.H. and MANSOUR, Z.S., *Linear q-difference equations.* Z. Anal. Anwend. **26** (2007), 481–494.

[2] ALBAYRAK, D., PUROHIT, S.D. and UÇAR, F., *On q-analogues of Sumudu transforms.* An. Şt. Univ. Ovidius Constanţa, **21(1)**, (2013), 239–260.

[3] ALTINTAŞ, O., ÖZKAN, Ö. and SRIVASTAVA, H.M., *Neighborhoods of a class of analytic functions with negative coefficients.* Appl. Math. Letters **13** (2000), 63–67.

[4] BANGEREZAKO, G. *Variational calculus on q-nonuniform lattices*, J. Math. Anal. Appl. **306 (1)** (2005), 161–179.

[5] GASPER, G. and RAHMAN, M., *Basic Hypergeometric Series*, Cambridge University Press, Cambridge, 1990.

[6] KAC, V.G. and CHEUNG, P., *Quantum Calculus*, Universitext, Springer-Verlag, New York, 2002.

[7] MANSOUR, Z.S.I., *Linear sequential q-difference equations of fractional order*, Fract. Calc. Appl. Anal., **12(2)** (2009), 159–178.

[8] PODLUBNY, I. *Fractional Differential Equations (An Introduction to Fractional Derivatives, Fractional Differential Equations, Some Methods of Their Solution and Some of Their Applications)*, Academic Press, San Diego-Boston-New York-London-Tokyo-Toronto, 1999.

[9] PUROHIT, S.D., *A new class of multivalently analytic functions associated with fractional q-calculus operators*, Fractional Differ. Calc., **2 (2)** (2012), 129–138.

[10] PUROHIT, S.D. and RAINA, R.K., *Certain subclass of analytic functions associated with fractional q-calculus operators*, Math. Scand., **109 (1)** (2011), 55–70.

[11] PUROHIT, S.D. and RAINA, R.K., *Chebyshev type inequalities for the saigo fractional integrals and their q-analogues*, J. Math. Inequal., **7(2)** (2013), 239–249.

[12] RAJKOVIĆ, P.M., MARINKOVIĆ, S.D. and STANKOVIĆ, M.S., *Fractional integrals and derivatives in q-calculus.* Appl. Anal. Discrete Math., **1** (2007), 311–323.

[13] SRIVASTAVA, H.M. and OWA, S. Editors, *Current Topics in Analytic Function Theorey*, World Scientific Publishing Company, Singapore, New Jersey, London and Hongkong, 1992.

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