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[Foupouagnigni, M.](#) (CM-YND-MSD); [Koepf, W.](#) (D-KSSL-MI); [Ronveaux, A.](#) (B-NDP)**On factorization and solutions of q -difference equations satisfied by some classes of orthogonal polynomials. (English summary)***J. Difference Equ. Appl.* **10** (2004), *no.* 8, 729–747.[33D45](#) ([33C45](#) [39A13](#))

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Summary: “We derive and factorize the fourth-order q -difference equations satisfied by orthogonal polynomials obtained from some perturbations of the recurrence coefficients of q -classical orthogonal polynomials. These perturbations include the r th associated, the anti-associated, the general co-recursive, co-recursive associated, co-dilated and the general co-modified q -classical orthogonal polynomials. Moreover, we find a basis of four linearly independent solutions of these fourth-order q -difference equations and express the modified families in terms of the starting ones.”

[References]

Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

1. R. Álvarez-Nodarse and J. Arvestú, On the q -polynomials in the exponential lattice $x(s) = c_1q^s + c_3$, *Integral Transform and Special Functions*, **8** (1999), 299–324. [MR1771452 \(2001b:33022\)](#)
2. R. Álvarez-Nodarse and J.C. Medem, q -Classical polynomials and q -Askey and Nikiforov-Uvarov Tableaux, *J. Comp. Appl. Math.*, **135** (2001), 157–196. [MR1850540 \(2003f:33027\)](#)
3. N.M. Atakishiyev, M. Rahman and S.K. Suslov, On classical orthogonal polynomials, *Constr. Approx.*, **11** (1995), 181–226. [MR1342384 \(96i:33029\)](#)
4. S. Belmehdi and A. Ronveaux, Polynômes associés des polynômes orthogonaux classiques. Construction via REDUCE, In: L. Arias, *et al.*, eds, *Orthogonal Polynomials and their Appli-*

- cations Universidad de Oviedo, 1989, pp 72–83.
5. J. Bustoz and M.E.H. Ismail, The associated ultraspherical polynomials and their q -analogues, *Can. J. Math.*, **34** (1982), 718–736. [MR0663314 \(84c:33013\)](#)
 6. T.S. Chihara, Introduction to Orthogonal Polynomials, Gordon and Breach, New York, 1978. [MR0481884 \(58 #1979\)](#)
 7. J. Dini, Sur les formes linéaires et polynômes orthogonaux de Laguerre-Hahn Thèse de Doctorat, Université Pierre et Marie Curie, Paris VI, 1988.
 8. J. Favard, Sur les polynômes de Tchebicheff, *C. R. Acad. Sci. Paris*, **200** (1935), 2052–2053.
 9. M. Foupouagnigni, Laguerre-Hahn Orthogonal Polynomials with respect to the Hahn Operator, Fourth-order Difference Equation for the r th Associated and the Laguerre-Freud Equations for the Recurrence Coefficients, Ph.D. Thesis, Université Nationale du Bénin, Bénin, 1998.
 10. M. Foupouagnigni, A. Ronveaux and W. Koepf, The fourth-order q -difference equation satisfied by the first associated q -classical orthogonal polynomials, *J. Comput. Appl. Math.*, **101** (1999), 231–236. [MR1664571 \(99j:33022\)](#)
 11. M. Foupouagnigni, W. Koepf and A. Ronveaux, Factorization of fourth-order differential equations for perturbed classical orthogonal polynomial, *J. Comput. Appl. Math.*, **162** (2004), 299–326. [MR2028031 \(2004j:33007\)](#)
 12. M. Foupouagnigni, W. Koepf and A. Ronveaux, On fourth-order difference equations for orthogonal polynomials of a discrete variable: derivation, factorization and solutions, *J. Diff. Eqn. Appl.*, **9** (2003), 777–804. [MR1995218 \(2004h:33017\)](#)
 13. M. Foupouagnigni, A. Ronveaux and M.N. Hounkonnou, The fourth-order q -difference equation satisfied by the associated orthogonal polynomials of the D_q -Laguerre-Hahn class, *J. Diff. Eqn. Appl.*, **7** (2001), 445–472. [MR1939594 \(2003m:33026\)](#)
 14. M. Foupouagnigni and A. Ronveaux, The fourth-order difference equation satisfied by the co-recursive of the q -classical orthogonal polynomials, *J. Comput. Appl. Math.*, **133** (2001), 355–365. [MR1858293 \(2002k:33017\)](#)
 15. M. Foupouagnigni and A. Ronveaux, The fourth-order difference equation satisfied by the co-recursive associated orthogonal polynomials of the D_q Laguerre-Hahn class, *J. Comput. Appl. Math.*, **153** (2002), 213–223.
 16. W. Hahn, Über Orthogonalpolynome die q -Differenzgleichungen genügen, *Math. Nachr.*, **2** (1949), 4–34. [MR0030647 \(11,29b\)](#)
 17. M.E.H. Ismail, Difference equations and quantized discriminants for q -orthogonal polynomials, *Adv. Appl. Math.*, **30** (2003), 562–589. [MR1973957 \(2005f:33032\)](#)
 18. M.E.H. Ismail and P. Simeonov, A fourth-order q -difference equation for the associated discrete q -orthogonal polynomials, *J. Math.*, **32** (2002), 679–690. [MR1934911 \(2003j:33050\)](#)
 19. W. Koepf and D. Schmersau, Recurrence equations and their classical orthogonal polynomial solutions, *Appl. Math. Comput.*, **128** (2002), 303–327. [MR1891025 \(2003i:33010\)](#)
 20. R. Koekoek and R. Swarttouw, The Askey-scheme of hypergeometric orthogonal polynomials and its q -analogue, Report no. 98–17, Faculty of Information Technology and Systems, Delft University of Technology, 1998.

21. F. Marcellán, J.S. Dehesa and A. Ronveaux, On orthogonal polynomials with perturbed recurrence relations, *J. Comp. Appl. Math.*, **30** (1990), 203–212. [MR1062324 \(91h:33003\)](#)
22. J.C. Medem, Polinomios ortogonales q -semiclásicos, Ph.D. Dissertation, Universidad Politécnica de Madrid, 1996.
23. J.C. Medem, R. Álvarez-Nodarse and F. Marcellán, On the q -polynomials: a distributional study, *J. Comp. Appl. Math.*, **135** (2001), 197–233. [MR1850540 \(2003f:33027\)](#)
24. M.B. Monagan, K.O. Geddes, K.M. Heal, G. Labahn, S.M. Vorkoetter, J. McCarron and P. DeMarco, Maple 8, Waterloo Maple, Inc.
25. A.F. Nikiforov and V.B. Uvarov, Special Functions of Mathematical Physics Birkhäuser, Basel, Boston, 1988. [MR0922041 \(89h:33001\)](#)
26. A.F. Nikiforov, S.K. Suslov and V.B. Uvarov, Classical Orthogonal Polynomials of a Discrete Variable, Springer, Berlin, 1991. [MR1149380 \(92m:33019\)](#)
27. A. Ronveaux and W. Van Assche, Upward extension of the jacobi matrix for orthogonal polynomials, *J. Approx. Theory*, **86** (1996), 335–357. [MR1405986 \(97k:42054\)](#)
28. S.K. Suslov, The theory of difference analogues of special functions of hypergeometric type, *Russ. Math. Surveys*, **44** (1989), 227–278. [MR0998364 \(91a:33015\)](#)

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