

Divided-difference equation and three-term recurrence relations of some systems of bivariate q -orthogonal polynomials

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In this work, partial divided-difference equations and three-term recurrence relations satisfied by the bivariate Askey-Wilson and the bivariate q -Racah polynomials are computed. By using limiting processes, partial divided-difference equations and three-term recurrence relations are also provided for each of the following families of orthogonal polynomials: the bivariate continuous dual q -Hahn, the bivariate Al-Salam-Chihara, the bivariate continuous q -Hahn, the bivariate q -Hahn, the bivariate dual q -Hahn, the bivariate q -Krawtchouk, the bivariate q -Meixner, and the bivariate q -Charlier polynomials. We obtain our results which are all new using mainly the `qsimpcomb` algorithm implemented in Maple in the package `qsum.mpl`.