Abstract

In this work, by solving a $d$-Geronimus problem, we introduce new examples of basic hypergeometric $d$-orthogonal polynomials which are useful to construct similar table to the $q$-Askey-scheme in the context of $d$-orthogonality. That, for $d = 1$, leads to a characterization theorem involving all polynomials belonging to the $q$-Askey-scheme, except the continuous $q$-Hermite ones. From some limit relations, we show that, the obtained $q$-polynomials represent the $q$-analogs of some known $d$-orthogonal polynomials.