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Genkai Zhang* (genkai@math.chalmers.se), Dept. of Math., Chalmers Univ. of Tech. and
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Consider a root system of type BC 1 on the real line \mathbb{R} with general positive multiplicities. The Cherednik-Opdam transform defines a unitary operator from an L^2 -space on \mathbb{R} to a L^2 -space of \mathbb{C}^2 -valued functions on \mathbb{R}^+ with the Harish-Chandra measure. By introducing a weight function of the form $\cosh(t) \tanh 2k t$ on \mathbb{R} we find an orthogonal basis for the L^2 -space on \mathbb{R} consisting of even and odd functions expressed in terms of the Jacobi polynomials (for each fixed λ and k). We find a Rodrigues type formula for the functions in terms of the Cherednik operator. We compute explicitly their Cherednik-Opdam transforms. We discover thus a new family of \mathbb{C}^2 -valued orthogonal polynomials. In the special case when $k = 0$ the even polynomials become Wilson polynomials, and the corresponding result was proved earlier by Koornwinder. (Received February 15, 2006)