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**Title:** New rational orthogonal systems in $L^2(\mathbb{I})$

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Blaschke functions play an important role in system identification. These functions form a group with respect to the composition of functions. In 2006 and 2007, the voice transform on the disc and on the torus was introduced by M. Pap and F. Schipp (see [3], [4] and [5]).

Using these representations and taking the images of orthonormal systems through the representation, we obtain new orthonormal systems on the Hilbert space $L^2((-1,1))$.

We will construct the rational analogues of the Legendre, Jacobi and Chebyshev systems taking their image through the representation, this way obtaining other new orthogonal systems. These are rational orthogonal systems.

The new rational orthogonal systems are suitable for rational interpolation. It is known that for some type of functions, rational interpolation is better than polynomial interpolation.

We give the analogue of the Christoffel–Darboux formula for the transformed orthogonal polynomial, and using this formula, we prove the discrete orthogonality of these systems.

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