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We consider singular continuous measures on the unit circle associated to groups of reflections in the hyperbolic disk. To each such measure we associate the family of orthogonal polynomials on the unit circle, the corresponding difference equation and the CMV operator, which is the unitary analog of the Jacobi operator. We describe the transition in the spectral properties of the CMV operator when the Hausdorff dimension of the support of the singular measure changes continuously from 0 to 1. (Received September 21, 2009)