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Constanze Liaw* (constanze_liaw@baylor.edu), Department of Mathematics, Baylor University, One Bear Place #97328, Waco, TX 76798, and **Catherine Beneteau, Alberto A. Condori, Daniel Seco** and **Alan A. Sola**. *Cyclic functions in Dirichlet type spaces over the bidisk.*

We study Dirichlet-type spaces of analytic functions in the unit bidisk, and their cyclic elements. These are the functions f for which there exists a sequence (p_n) of polynomials in two variables such that $\|p_n f - 1\| \rightarrow 0$ as $n \rightarrow \infty$. We obtain a number of conditions that imply cyclicity, and, by using results concerning Hilbert spaces of functions of one complex variable and comparisons between norms in one and two variables, we obtain sharp estimates on the best possible rate of decay of the norms $\|p_n f - 1\|$ for certain classes of functions.

We present a polynomial with no zeros on the bidisk that is not cyclic in a range of Dirichlet-type spaces (including the Dirichlet space). Since in one complex variable all analytically continuable functions with no zeros on the unit disk are cyclic, this exemplifies the contrast between cyclicity in one versus two complex variables. Further, we extend from the disk to the bidisk Brown and Shield's proof of the necessity of the capacity zero condition (replaced by an appropriate notion) for cyclic functions. (Received September 11, 2013)