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Cyclic polynomials on the bidisk

Let $\mathcal{D}_\alpha$ be the Hilbert space of holomorphic functions $f(z) := \sum_{k \geq 0} a_k z^k$ on the unit disk such that $\sum_{k \geq 0} (k+1)^\alpha |a_k|^2 < \infty$. It is well known that, if $-\infty < \alpha \leq 1$, then a polynomial $p(z)$ is cyclic in $\mathcal{D}_\alpha$ (that is, it generates the whole of $\mathcal{D}_\alpha$ as a closed shift-invariant subspace) iff it has no zeros in the open unit disk; and if $1 < \alpha < \infty$, then $p(z)$ is cyclic iff it has no zeros in the closed unit disk. In this talk, I shall discuss an analogous result for function spaces on the bidisk. (Joint work with Greg Knese, Łukasz Kosiński and Alan Sola.)