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Vladimir Bolotnikov* (vladi@math.wm.edu), Williamsburg, VA 23185-8795, and **Joseph A Ball**. *Observability operators and backward-shift invariant subspaces of certain reproducing kernel Hilbert spaces over the unit ball*. Preliminary report.

It is known that subspaces of the Hardy space H^2 of the unit disk occur as the range of an observability operator as the range of an observability operator associated with a discrete-time linear system with stable state-dynamics, as well as the functional-model space for a Hilbert space contraction operator. Parallel results are known in several multivariable settings, in particular, when the space H^2 is replaced by the Drury-Arveson space, the reproducing kernel Hilbert space over the unit ball \mathbb{B}^d in complex d -dimensional space \mathbb{C}^d based on the d -variable Szegő reproducing kernel $(1 - z_1\bar{\zeta}_1 - \dots - z_d\bar{\zeta}_d)^{-1}$, whereas the backward-shift operator is replaced by the d -tuple $(M_{z_1}^*, \dots, M_{z_d}^*)$ of adjoints of shift operators $M_j : f(z) \rightarrow z_j f(z)$.

In the talk (based on the ongoing joint project with J.A. Ball), we will discuss backward-shift invariant subspaces of reproducing kernel Hilbert spaces with reproducing kernels $(1 - z_1\bar{\zeta}_1 - \dots - z_d\bar{\zeta}_d)^{-n}$ for $n > 1$. (Received September 02, 2019)