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Kelly Bickel* (kbickel@math.wustl.edu). *Fundamental Agler Decompositions.*

It is well-known that every holomorphic function $\phi : \mathbb{D}^2 \rightarrow \mathbb{D}$ possesses an Agler decomposition; i.e. that there exist positive semi-definite kernels functions K_1 and K_2 such that

$$1 - \phi(\lambda)\overline{\phi(\mu)} = (1 - \lambda_1\bar{\mu}_1)K_1(\lambda, \mu) + (1 - \lambda_1\bar{\mu}_1)K_2(\lambda, \mu) \quad \forall \lambda, \mu \in \mathbb{D}^2. \quad (1)$$

In general, such decompositions are difficult to write down explicitly. In this talk, we present a constructive, elementary proof of (1) using fundamental shift-invariant subspaces of the Hardy space on the bidisk. We then use these constructed decompositions to analyze properties about general Agler decompositions. (Received September 09, 2011)