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Joseph A Ball* (jball@math.vt.edu), Department of Mathematics, Virginia Tech, Blacksburg, VA 24061, and **Moises D Gurerra-Huaman**. *Test functions, kernel functions, interpolation and transfer-function realization for multiplier algebras: the matrix-valued setting.*

The classical Schur class consists of holomorphic functions on the unit disk with values equal to Hilbert space contraction operators. Equivalent characterizations are: norm at most 1 as a multiplier on the Hardy space over the unit disk, positivity of the associated de Branges-Rovnyak kernel, and realization as the transfer function of a dissipative (or even conservative) discrete-time input/state/output linear system. A number of more general settings have now been worked out where these properties are preserved in various forms. One such is the test-function approach where one defines a generalized Schur class as the intersection of the unit balls of the multiplier algebras over the set of all positive kernels for which each function in a preassigned collection of test functions is a contractive multiplier. The main new point addressed in this talk is the extension of this test-function approach to the case where the test functions, kernel functions and Schur-class functions are all allowed to be matrix- or operator-valued. We highlight several concrete examples where this more general setting adds insight beyond that obtained from previous work. (Received May 14, 2011)