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Joseph A Ball* (joball@math.vt.edu), Department of Mathematics, 460 McBryde Hall, 225 Stanger Street, Blacksburg, VA 24060-0123, and **Vladimir Bolotnikov**. *Dilation and functional-model theory for Hilbert space noncommutative n -hypercontractive operator tuples*. Preliminary report.

The Sz.-Nagy-Foias model theory for C_0 contraction operators combined with the Beurling-Lax theorem establishes a correspondence between any two of the following four notions: (1) shift-invariant subspaces, (2) operator-inner functions, (3) conservative discrete-time input/state/output linear systems, and (4) C_0 Hilbert-space contraction operators. Recent work of Olofsson and of the authors has extended these ideas to the weighted Bergman space setting, where the notion of C_0 contraction operator T is replaced by a C_0 $*$ - n -hypercontraction (so $\sum_{j=0}^k \binom{k}{j} (-1)^j T^j T^{*j} \succeq 0$ for $k = 1, \dots, n$). In this talk we discuss a model theory for freely noncommutative C_0 n -hypercontractive operator tuples $T = (T_1, \dots, T_d)$ on a Hilbert space \mathcal{H} . The special case $n = 1$ of the construction collapses to the Popescu generalized Sz.-Nagy-Foias dilation and model theory for a C_0 row-contractive operator tuple. (Received September 05, 2014)