A von Neumann type inequality for commuting row contractions

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It is known that there is no von Neumann type inequality for commuting row contractions, in the sense that there is no constant C_d such that

$$\|p(T)\| \leq C_d \sup_{z \in \mathbb{B}_d} |p(z)|$$

for every polynomial p in d commuting variables and every commuting row contraction $T = (T_1, ..., T_d)$. We show that if one restricts attention to row contractions acting on a space of finite dimension n, then one can obtain such a von Neumann type inequality with a constant $C_d(n)$ that depends also on n (on the other hand, the constant can also be chosen to be independent of d). This might seem both obvious and esoteric, but the proof turns out to be subtler than one might guess, and the result turns out to have several interesting consequences for some important operator algebras.

The talk is based on the paper [1], co authored with Michael Hartz and Stefan Richter.

[1] M. Hartz, S. Richter and O.M. Shalit, *Von Neumann's inequality for row contractive matrix tuples*, to appear in Math. Z.