A Drury-type bound for ρ-contractions

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We discuss a new Drury-type bound for (Sz.-Nagy–Foiaş) ρ-contractions for arbitrary $\rho \geq 1$. More precisely, for any bounded Hilbert space operator A whose numerical radius is at most 1 it holds that

$$\|p(A)\| \leq \frac{\rho}{2}(1 - |p(0)|^2) + \sqrt{\frac{\rho^2}{4}(1 - |p(0)|^2)^2 + |p(0)|^2}$$

for all polynomials p with $\sup_{|z|\leq 1} |p(z)| \leq 1$. This result interpolates von Neumann's inequality ($\rho = 1$) and Drury's classical bound ($\rho = 2$).

This talk is based on joint research with Felix Schwenninger.