Joint invariant subspaces for tuples of polynomially bounded operators

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(Joint work with Vladimir Müller)

We present some results of existence of the joint invariant subspaces for commuting n-tuples $T = (T_1, \dots, T_n)$ of bounded linear operators $T_j : X \to X$ on a complex Hilbert or Banach space X. The main result states, for $X =$ a Hilbert space, that if the Taylor joint spectrum of T is dominant in the unit polydisc $D = \{z \in C^n : |z_j| < 1\}$ and T is polynomially contractive (namely $\|p(T)\| \leq \sup_D |p|$ for all polynomials $p \in C[z]$) and of class C_{00}, then T has jointly invariant closed linear subspaces. The similar result holds as well for T polynomially bounded on a Banach space X, provided that the essential Taylor joint spectrum of T be dominant in D.