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Joint spectra and annihilators in multivariate operator theory

For an appropriately regular, single Hilbert space contraction T , it is known that the spectrum can be described in terms of the annihilator, that is the ideal $\text{Ann}(T)$ of bounded holomorphic functions f on the unit disc satisfying $f(T) = 0$. Indeed, the spectrum coincides with the so-called support of $\text{Ann}(T)$. In this talk, we explore the extent to which a similar statement is valid for commuting tuples of operators $T = (T_1, T_2, \dots, T_d)$. The corresponding multivariate notion of support for $\text{Ann}(T)$ is rather subtle. We will give a more concrete description of the support in terms of the zero set of $\text{Ann}(T)$ when it is assumed that the underlying space of holomorphic functions has the Corona property.