ON THE HYPERREFLEXIVITY AND k-HYPERREFLEXIVITY OF POWER PARTIAL ISOMETRIES

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joint work with M. Ptak

Let $\mathcal{H}$ be a complex separable Hilbert space. Let $B(\mathcal{H})$ denote the algebra of bounded linear operators on $\mathcal{H}$. For an operator $T \in B(\mathcal{H})$ let us consider $\mathcal{W}(T)$ a unital subalgebra of $B(\mathcal{H})$ containing the operator T and closed in WOT topology. Denote by $\operatorname{Lat} T$ the set of all projections onto closed subspaces invariant for operator T. Now, for a given operator $A \in B(\mathcal{H})$, except the usual distance from A to $\mathcal{W}(T)$ denoted by $\operatorname{dist}(A, \mathcal{W}(T))$, we can define the distance ,,determined by its invariant subspaces" as $\alpha(A, \mathcal{W}(T)) = \sup\{\|(I-P)AP\| : P \in \operatorname{Lat} T\}$. Usually $\alpha(A, \mathcal{W}(T)) \leqslant \operatorname{dist}(A, \mathcal{W}(T))$. The operator $T \in B(\mathcal{H})$ is called *hyperreflexive* if the usual distance can be controlled by the distance α, i.e. there is a positive constant κ such that

$$\operatorname{dist}(A, \mathcal{W}(T)) \leqslant \kappa\ \alpha(A, \mathcal{W}(T)) \quad \text{for all} \quad A \in B(\mathcal{H}).$$

It cannot be expected that all power partial isometries are hyperreflexive or even reflexive since the operator on a finite dimensional Hilbert space given by a Jordan block matrix is not reflexive. On the other hand there are many power partial isometries which are reflexive or even hyperreflexive, e.g. the unilateral shift.

In [1] full characterization (if and only if condition) of reflexivity of completely non–unitary power partial isometries was given.

Full characterization of hyperreflexive completely non-unitary power partial isometries and k–hyperreflexive power partial isometries will be presented.

References

[1] E. A. Azoff, W. S. Li, M. Mbekhta, M. Ptak, *On Consistent operators and Reflexivity*, Integr. Equ. Oper. Theory, **71** (2011), 1–12.