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Some Remarks on Orthogonality of Bounded Linear Operators

We explore the relation between the orthogonality of bounded linear operators in the space of operators and that of elements in the ground space. To be precise, we study if $T, A \in \mathbb{L}(\mathbb{X}, \mathbb{Y})$ satisfy $T \perp_B A$, then whether there exists $x \in \mathbb{X}$ such that $Tx \perp_B Ax$ with ||x|| = 1, ||Tx|| = ||T||, where \mathbb{X}, \mathbb{Y} are normed linear spaces. In this context, we introduce the notion of Property P_n for a Banach space and illustrate its connection with orthogonality of a bounded linear operator between Banach spaces. We further study Property P_n for various polyhedral Banach spaces.

Keywords: Orthogonality, linear operators, norm attainment, polyhedral Banach spaces.

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