

**THE PROJECTIONS ON SUBSPACES
AND ON CLOSED CONVEX SETS. SOME
PARADOX AND ULTIMATE SOLUTIONS**

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Abstract. We give an ultimate solution of Amemiya-Ando problem and we point out some relations with the conjecture of S. Kwapien. We show that for any $x = x^* \in B(H)$ and for $n = 4$ there exist $\lambda_i \in \mathbb{R}$, $p_i \in \text{proj } H$ satisfying $x = \sum_{1 \leq i \leq 4} \lambda_i p_i$. Moreover, $n = 3$ is not enough. Some paradox for projections on convex sets will be reminded, and solutions of some problems for relaxed projections will be given.