Norms of Elementary operators.

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Abstract

Our main result concern the operator $T_{a,b} : B(H) \to B(H)$ defined by $T_{a,b}(x) = axb + bxa$ for all $x \in H$ and a,b fixed in $B(H)$. No formula is known for computing the norm $T_{a,b}$. Clearly, $\|T_{a,b}\|_{B(H)} \leq 2\|a\|\|b\|$. But the largest possible c such that $\|T_{a,b}\|_{B(B)} \geq c\|a\|\|b\|$ for all $a,b \in B(H)$ and $c \in \mathbb{R}$. In this paper, we determine the norm of a two-sided symmetric operator in an algebra. More precisely, we investigate the lower bound of the operator using the injective tensor norm. Further, we determine the norm of the inner derivation on irreducible C*- algebra and confirm Stamfli's result for these algebras that $\|T_{a,b}\| \leq 2\|a\|\|b\|$. *Mathematics Subject Classification*: Primary 46L57; Secondary 47A30, 47A80

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