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BOUNDED LINEAR OPERATORS BETWEEN C^*-ALGEBRAS

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CONTENTS

Introduction. Let $u: A \to B$ be a bounded linear operator between two C^*-algebras A, B. The following result was proved in [P1].

THEOREM 0.1. *There is a numerical constant K_1 such that for all finite sequences $x_1, \dots, x_n$ in A we have*

$$(0.1)_1 \qquad \max\{\|(\textstyle\sum u(x_i)^*u(x_i))^{1/2}\|_B, \|(\sum u(x_i)u(x_i)^*)^{1/2}\|_B\}$$
$$\leqslant K_1 \|u\| \max\{\|(\textstyle\sum x_i^*x_i)^{1/2}\|_A, \|(\sum x_i x_i^*)^{1/2}\|_A\}.$$

A simpler proof was given in [H1]. More recently, another alternate proof appeared in [LPP]. In this paper we give a sequence of generalizations of this inequality.

The above inequality $(0.1)_1$ appears as the case of "degree one" in this sequence. The next case of degree 2 seems particularly interesting, and so we now formulate it explicitly.

Let us assume that $A \subset B(H)$ (embedded as a C^*-subalgebra) for some Hilbert space H, and similarly that $B \subset B(K)$. Let (a_{ij}) be an $n \times n$ matrix of elements of A. We define

$$[(a_{ij})]_{(2)} = \max\{\|(a_{ij})\|_{M_n(A)}, \|(a_{ij}^*)\|_{M_n(A)}, \|(\textstyle\sum_{ij} a_{ij}^* a_{ij})^{1/2}\|_A, \|(\sum_{ij} a_{ij} a_{ij}^*)^{1/2}\|_A\}.$$

Then we have the following result:

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