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Leonid Slavin* (leonid@math.missouri.edu), Mathematics Department, 202 Math Science Building, University of Missouri, Columbia, MO 65203. *Bellman function and a generalized Grothendieck inequality*. Preliminary report.

The classical Grothendieck inequality says that if $A = \{a_{ij}\}$ is an $n \times n$ real matrix such that

$$|s^T A t| \leq \|s\|_\infty \|t\|_\infty, \forall s, t \in \mathbb{R}^n, \quad (1)$$

then, for any real Hilbert space H and vectors $x_1, \dots, x_n, y_1, \dots, y_n \in H$,

$$\left| \sum_{i,j=1}^n a_{ij}(x_i, y_j) \right| \leq K_G \max_i \|x_i\|_H \max_i \|y_i\|_H \quad (2)$$

for some absolute constant K_G .

The sharp value of the Grothendieck constant K_G is not known. Given the effectiveness of the Bellman function method in proving sharp integral estimates, we study an integral version of (1),(2). Furthermore, our formulation is for $L^p \rightarrow L^q, p > 1$, kernels, giving the l^∞ case above as a limit. This is a report on work in progress. (Received August 21, 2007)