Absolutely p-Summing Operators in Krein Spaces

G. Wanjala

Let $\mathcal{H}$ and $\mathcal{K}$ be Krein spaces and $1 \leq p < \infty$. A linear operator $u : \mathcal{H} \to \mathcal{K}$ is *absolutely* p*-summing* if there is a constant $c > 0$ such that for each positive integer m and any vectors $x_1, \ldots, x_n$ in $\mathcal{H}$ we have

$$\left(\sum_{i=1}^{m} \| \, u x_i \, \|^p \right)^{1/p} \leq \sup \left\{ \left(\sum_{i=1}^{m} |\langle \; y \; , \; x_i \; \rangle|^p \right)^{1/p} : y \in \mathcal{H}, \| \, y \, \| \leq 1 \right\}.$$

We show that a linear map $u : \mathcal{H} \to \mathcal{K}$ is absolutely p-summing precisely when it takes weakly p-summable sequences in $\mathcal{H}$ to strongly p-summable sequences in $\mathcal{K}$. We also show that the composition of a p-summing operator with any bounded linear operator is absolutely p-summing. We shall restrict our discussion to the case $p = 2$.