Abstract. In this paper, a $K$-frame $\{f_k\}_{k \in \mathbb{Z}}$ for a Hilbert space $H$, with the form $\{T^k f_0\}_{k \in \mathbb{Z}}$ for an operator $T$ is analyzed. Some conditions under which a $K$-frame can be represented by an operator and then investigate the properties of this operator are discussed. More specifically, a necessary and sufficient condition for a $K$-frame that has an operator representation can be obtained by a $K$-dual. Furthermore, we find the boundedness of the operator $T$ has an integral relationship with the operator $K$ when a $K$-frame can be represented by an operator $T$. In addition, the stability of operator representation is studied. We prove that the stability and boundedness are preserved under certain restrictions on the perturbation condition. A pretty small perturbation will heavily affect the property of being representable by an operator if $\mu > 0$, and an example is used to illustrate it. Furthermore, some elements from a subspace of $H$ are used to perturb a $K$-frame, and then some useful stability results are obtained.


Keywords and phrases: Frames, $K$-frames, boundedness, stability; $K$-dual.

REFERENCES


