INVOLUTIONS OF DUAL SPLIT-QUATERNIONS

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Abstract

Involutions and anti-involutions, which are self-inverse linear mappings, are useful tools to determine rigid-body (screw) motions. In 3-dimensional Euclidean space $\mathbb{R}^3$, a reflection of a vector in a plane can be represented by an involution or anti-involution mapping obtained by using real-quaternions. Also, a reflection of a line about a line in $\mathbb{R}^3$ can be represented by an involution or anti-involution mapping obtained by using dual-quaternions. In this study, we will represent involution and anti-involution mappings obtained by using dual split-quaternions, and a geometric interpretation of each as rigid-body motions in 3-dimensional Minkowski space $\mathbb{R}^3_1$.

Keywords: Dual split-quaternions; involutions; rigid-body (screw) motions.

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