Properties of the Clifford Fourier transform for for color image processing

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In this contribution, we take a look at some properties of the Clifford Fourier transform for color image processing. This transformation is constructed by using group actions in a geometric approach, introduced by Batard, Bethier and Saint-Jean. It is defined on vector-valued functions in the Clifford algebra $\mathbb{R}_{4,0}$, so the question arises how this transform acts on the basis elements of this space. We prove that both the cartesian and spherical basis are well-behaved under this transform. This is rather surprising as most other hypercomplex Fourier transforms are only diagonalized by one of these bases.