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The Wavelet Transform in Clifford Analysis

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Abstract. The upper half space $G = \{(x_0, \ldots, x_n) : x_0 > 0\}$ can be considered as the group generated by dilations and translations on $\mathbb{R}^n$. This group has a natural unitary representation on $L_2(\mathbb{R}^n)$. Using the continuous wavelet transform, certain Banach and Hilbert spaces of functions monogenic (i.e. solutions of the Cauchy-Riemann operator) on the Poincaré half space are constructed. The Hilbert spaces are linked with the fractional calculus of the Dirac operator on $\mathbb{R}^n$.

Keywords. Clifford analysis, wavelet transform, weighted Bergman spaces, invariant Dirac operator.

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