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On Quaternionic Analysis and its Modifications

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Abstract. Quaternionic analysis — and in higher dimensions Clifford analysis — are well-known extensions of classical complex analysis. A modification of this theory, based on hyperbolic geometry, has recently been developed by the first author in [18], [19] and [20]. A unifying theory, introduced by G. Laville and I. Ramadanoff in [16], also exists. In this paper we compare these three theories with each other. We thereby mainly focus on the Clifford algebras $\mathcal{C}_{0,2}$ and $\mathcal{C}_{0,3}$. In case of $\mathcal{C}_{0,2} \cong \mathbb{H}$ we present, for the modified theory, a Cauchy-type formula for the so-called (H)-solutions (see [19]), which is based on some recent result of S. L. Eriksson-Bique [3].

Keywords. Generalized function theory, quaternions, Dirac operator, hyperbolic metric.

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