

# On Modified Dirac Operators in Geometric Algebras

## Heikki Orelma

Tampere University of Technology, Department of Mathematics  
P.O. Box 553, 33101 Tampere, Finland  
Email: Heikki.Orelma@tut.fi

The aim of this presentation is to consider some topics of hyperbolic function theory in geometric algebras i.e. Clifford algebras  $\mathcal{C}\ell_{n+1,0}$ . The Clifford algebra  $\mathcal{C}\ell_{n+1,0}$  is generated by unit vectors  $\{e_i\}_{i=0}^n$  with positive squares  $e_i^2 = +1$ .

We will introduce the modified Dirac operator  $H_k$ . The operator  $H_k$  is a generalization of classical Dirac operator in Clifford analysis. A solution of the equation  $H_k f = 0$  is called a hypergenic function. We consider also some representation theorems to hypergenic functions. Using contractions and an exterior product of Clifford numbers we split the operator  $H_k$  to the form

$$H_k f = (D - \frac{k}{x_0} e_0) \lrcorner f + D \wedge f,$$

where  $D$  is the Dirac operator. Briefly we will consider some local properties of hypergenic functions and other interesting results.