UNIVERSITY OF AVEIRO
Department of Mathematics

Complex and Hypercomplex Analysis

SEMINAR
of the
COMPLEX AND HYPERCOMPLEX ANALYSIS GROUP
and of the
Thematic Line INVERSE PROBLEMS IN HEALTH SCIENCES

Sala Sousa Pinto (2^o piso), Departamento de Matemática

14/02/2019, 16:00

Hypermonogenic Plane Wave Solutions of Dirac equation in Clifford algebra and Superspace

Heikki Orelma
Heikki.Orelma@tuni.fi
Civil Engineering, FI-33014 Tampere University, Finland

In the first part we define hypermonogenic solutions of the Dirac operator in $\mathbb{R}^p \times \mathbb{R}^q$ and study some basic properties. Hypermonogenic solutions form a natural function class in classical Clifford analysis. After that, we define the corresponding hypermonogenic plane wave solutions and deduce explicit methods to compute these functions.

In the second part, we obtain Cauchy-Kovalevskaya theorems for hypermonogenic superfunctions depending only on purely bosonic and fermionic vector variables. In addition, we use these results to construct plane wave examples of such functions.

This presentation based on joint work with Dr. Alí Guzmán Adán and Prof. Franciscus Sommen. All details may be found in our papers [1, 2].

References

[1] Guzmán A., Orelma H., Sommen F., *Hypermonogenic solutions and plane waves of the Dirac operator in* $\mathbb{R}^p \times \mathbb{R}^q$, accepted in Applied Mathematics and Computation, Springer, 2018

[2] Guzmán A., Orelma H., Sommen F., *Hypermonogenic Plane Wave Solutions of the Dirac equation in Superspace*, submitted

This seminar is supported through the CIDMA - Center for Research and Development in Mathematics and Applications, and the Portuguese Foundation for Science and Technology ("FCT–Fundação para a Ciência e a Tecnologia"), within project UID/MAT/04106/2019.

FCT Fundação para a Ciência e a Tecnologia

CIDMA CENTRO DE I&D EM MATEMÁTICA E APLICAÇÕES
CENTER FOR R&D IN MATHEMATICS AND APPLICATIONS