

MODIFIED 3–SPLIT DIRAC OPERATOR

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ABSTRACT. The purpose of this paper is to introduce the concept of the so-called modified Dirac operator over the algebra of 3–split numbers, denoted by \mathcal{M} . By the mean of this operator we provide a generalization of monogenic functions and we show some of their properties. Moreover, we establish some Fischer-type decomposition theorems for the operator \mathcal{M} and its conjugate.

REFERENCES

- [1] M. Ben Ammar, *Décompositions de l'Opérateur de Dirac dans L'Algèbre de Clifford*, Int. Math. Forum, Vol. 6, 2011, no. 61, 3023 - 3041.
- [2] F. Colombo, I. Sabadini, F. Sommen, and D. C. Struppa, *Analysis of Dirac Systems and Computational Algebra*, volume 39 of Progress in Mathematical Physics. Birkhäuser Boston Inc., Boston, MA, 2004.
- [3] Y. F. Gong, T. Qian and D. Y. Du, *Structure of Solutions of Polynomial Dirac Equations in Clifford Analysis*, Complex Variables, Vol. 49, No. 1, pp. 15–24, 15 January 2004.
- [4] R. Helmuth Malonek and D. Peña Peña, *Fischer decomposition by inframonogenic functions*, CUBO A Mathematical Journal, Vol.12, No 02, (189-197). June 2010.
- [5] I. Kra and S. R. Simanca, *On circulant matrices*, Notices of the AMS, Volume 59, Number 3, March 2012.
- [6] M. Ku, U. Kähler, and P. Cerejeiras, *Solutions to a Class of Polynomially Generalized Bers–Vekua Equations Using Clifford Analysis*. Arch. Math. (Brno), Tomus 48 (2012), 371-385.
- [7] F. Messelmi, *Hyperholomorphicity of multisplit functions*, Electron. J. Math. Anal. Appl., Vol. 6(2) July 2018, pp. 295-306.
- [8] F. Messelmi, *Multisplit numbers*, Electron. J. Math. Anal. Appl., Vol. 3(2) July 2015, pp. 154-172.
- [9] R. Rocha-Chávez, M. Shapiro and F. Sommen, *Integral theorems for functions and differential forms in \mathbb{C}^m* , CHAPMAN & HALL/CRC, August 3, 2001.
- [10] M. Shapiro, D. C. Struppa, A. Vajiac, M. B. Vajiac, *Hyperbolic numbers and their functions*, An. Univ. Oradea Fasc. Mat., Tom XIX (2012), 265-283.
- [11] H. Yuan, *Boundary Value Problems for Modified Dirac Operators in Clifford Analysis*, Bound Value Probl 2015, 158, (sep2015): 1-11.

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