Time-fractional operator calculus in Clifford analysis

Milton Ferreira[1]

[1] School of Technology and Management, Polytechnic of Leiria, P-2411-901, Leiria, Portugal

[2] Center for Research and Development in Mathematics and Applications (CIDMA)

University of Aveiro, Aveiro, Portugal.

We present a time-fractional operator calculus in fractional Clifford analysis for the time-fractional parabolic Dirac operator. Initially, we present the conditions of the L_p-integrability of the fundamental solutions of the multidimensional time-fractional diffusion and parabolic Dirac operators. Then we introduce the time-fractional analogs of the Teodorescu and Cauchy-Bitsadze operators in a cylindrical domain, and we investigate their main mapping properties. We show also a time-fractional version of the Borel-Pompeiu formula based on a time-fractional Stokes' formula.