Adv. appl. Clifford alg. *Online First*

DOI 10.1007/s00006-003-0000

Advances in Applied Clifford Algebras

Construction of Octonionic Polynomials

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Abstract. In a previous paper "[*On Octonionic Polynomials*", Advances in Applied Clifford Algebras, **17** (2), (2007), 245–258.] we discussed generalizations of results on quaternionic polynomials to the octonionic polynomials. In this paper, we continue this generalization searching for methods to construct octonionic polynomials with a prescribed set of zeros.

Two iterative methods, valid for the quaternions, are applied to construct octonionic polynomials with limited results. The non-associativity of the octonion product does not allow the prescribed set of zeros to be the set of zeros of the constructed polynomial. Nevertheless, we will show that one of the methods has some advantage relatively to the other.

Finally, a closed form method is given to construct an octonionic polynomial with a prescribed set of zeros. This method requires the inversion of a block Vandermonde matrix. The necessary and sufficient conditions for the existence of the inverse are studied.

Mathematics Subject Classification (2000). 11R52, 20G20.

Keywords. Division algebra, polynomials, zeros of polynomials, octonions, block Vandermonde matrix.

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Received: January 20, 2008
Accepted: March 25, 2008