

Geometric Tri-Product of the Spin Domain and Clifford Algebras

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Abstract. We show that the triple product defined by the spin domain (Bounded Symmetric Domain of type 4 in Cartan's classification) is closely related to the geometric product in Clifford algebras. We present the properties of this tri-product and compare it with the geometric product.

The spin domain can be used to construct a model in which spin 1 and spin 1/2 particles coexist. Using the geometric tri-product, we develop the geometry of this domain. We present a geometric spectral theorem for this domain and obtain both spin 1 and spin 1/2 representations of the Lorentz group on this domain.

Keywords. Spin triple product; Spin domain; Geometric product; Lorentz group representations.

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