Abstract Submitted
for the APR15 Meeting of
The American Physical Society

Algebraic Apect of Helicities in Hadron Physics MURAT AN, CHUENG JI, North Carolina State University — We examined the relation of polarization vectors and spinors of $(1,0) \oplus (0,1)$ representation of Lorentz group in Clifford algebra $Cl_{1,3}$, their relation with standard algebra, and properties of these spinors. $Cl_{1,3}$ consists of different grades:e.g. the first and the second grades represent $(1/2, 1/2)$ and $(1,0) \oplus (0,1)$ representation of spin groups respectively with 4 and 6 components. However, these Clifford numbers are not the helicity eigenstates and thus we transform them into combinations of helicity eigenstates by expressing them as spherical harmonics. We relate the spin-one polarization vectors and $(1,0) \oplus (0,1)$ spinors under one simple transformation with the spin operators. We also link our work with Winnberg's work [1] of a superfield of a spinors of Clifford algebra by giving a physical meaning to Grassmann variables and discuss how Grassman algebra is linked with Clifford algebra.

[1] J.O.Winnberg, J. of Math Phys Vol 18, 625 (1977).

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Date submitted: 09 Jan 2015 Electronic form version 1.4