



Contribution ID: 95

Type: **Talk**

Summary of Super Doubler Approach on Exact Lattice Supersymmetry

Friday, 17 July 2015 17:50 (20 minutes)

Recently we have proposed a lattice SUSY formulation which we may call super doubler approach, where chiral fermion species doublers are identified as super partners of extended supersymmetry. We claim that the super symmetry is exactly kept on the lattice. However the formulation is nonlocal and breaks lattice translational invariance. We argue that these features cause no fundamental difficulties in the continuum limit. Furthermore a naive formulation breaks associativity of the product of fields and thus cannot be applicable to super Yang-Mills theory. We propose a modified super doubler approach to recover the associativity, which is essentially equivalent to the continuum formulation even for a finite lattice constant. We discuss fundamental meanings of the formulation.

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Session Classification: Theoretical Developments

Track Classification: Theoretical Developments