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A light-front supersymmetric field theory

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In this talk, we consider a light-front supersymmetric field theory described by the Wess-Zumino model (WZM) which remains invariant under rigid/global supersymmetry transformations (that rotate bosons into fermions and fermions into bosons). The theory satisfies the super Poincare algebra (SPA) and has a non-manifest supersymmetry (different from the superfield formalism). The instant-form (IF) quantization (IFQ) of the theory is being facilitated due to the fact that $(\gamma^0)^2 = 1$ even though the theory has fermi fields. However, new problems arise in the light-front (LF) quantization (LFQ) of the theory originating from the fact that $(\gamma^\pm)^2 = 0$ where $\gamma^\pm := (\gamma^0 \pm \gamma^3)$. This difficulty gets resolved if one goes to the formalism of so-called good fermions and the bad fermions (*à la* Mannheim, Lowdon and Brodsky (MLB)) that one defines with the help of the projection operators of the theory ($\Lambda^\pm := \frac{1}{2}\gamma^0\gamma^\pm$). Using this formalism, we study the LFQ of this theory using the Hamiltonian and path integral quantization procedures.

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