

Gauge and Rigid Symmetries of Light-cone Yang-Mills Classical Mechanics

D. M. Mladenov

*Dept of Theoretical Physics, St Kliment Ohridski University of Sofia
5 J. Bourchier Blvd., 1164 Sofia, Bulgaria*

The Hamiltonian dynamics and symmetries of the light-cone version of $SU(2)$ Yang-Mills classical mechanics, which originates from the light-cone version of the corresponding field theory under the supposition of the gauge potential dependence on light-cone time alone, is considered. According to the Generalized Hamiltonian formulation the light-cone model possesses a mixed system of first and second class constraints in contrast to its conventional counterpart, the instant form Yang-Mills classical mechanics. After a separation of the constraints of the model into sets of first and second-class constraints the generator of gauge symmetry group is constructed. It is found that the algebra of gauge symmetry is isomorphic to $su(2) \otimes u(1) \otimes u(1)$. The relation between the gauge and $SL(2, \mathbb{R})$ dynamical symmetry group of the light-cone $SU(2)$ Yang-Mills classical mechanics is discussed.

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