Contribution ID: **21** Type: **Talk/Seminar**

Canonical Quantization of Massive Symmetric Rank-Two Tensor in String Theory

Thursday, 26 September 2019 11:00 (40 minutes)

Canonical quantization of massive symmetric rank-two tensor in string theory has been studied. The Lagrangian describing symmetric rank-two tensor, containing two Stueckelberg fields, was obtained by Siegel and Zwiebach from string field theory. Performing canonical analysis, we found that the Lagrangian possesses first class constraints only, which generate a local gauge transformation. By an explicit calculation, we show that the constraints form a closed algebra only in the critical dimension of string, $d = 26$. It reminds us that the origin of local symmetry is nilpotency of BRST operator, which is valid only in the critical dimension. In a particular gauge, imposed on the Stueckelberg fields, the gauge invariant Lagrangian of Siegel and Zwiebach reduces to the Fierz-Pauli Lagrangian proposed for a massive spin-two particle. Thus, the Fierz-Pauli Lagrangian is a gauged fixed version of the gauge invariant Lagrangian for massive symmetric rank-two tensor. In comparison to the Fierz-Pauli Lagrangian, which contains second class constraints, it is much simpler to quantize the gauge invariant Lagrangian. We also constructed a covariant propogator which may be useful to develop a perturbation theory for massive spin-two particle.

Primary author: Prof. LEE, Taejin (Department of Physics, Kangwon National University)

Presenter: Prof. LEE, Taejin (Department of Physics, Kangwon National University)

Session Classification: Selected Talks

Track Classification: Selected Talks