Contribution ID: **120** Type: **Poster**

Renormalizability of pure $\mathcal{N} = 1$ Super Yang-Mills in the Wess-Zumino gauge in the presence of the local composite operators A^2 and $\bar{\lambda}\lambda$

Tuesday 20 March 2018 16:00 (1 hour)

The $\mathcal{N} = 1$ Super Yang-Mills theory in the presence of the local composite operator A^2 is analyzed in the Wess-Zumino gauge by employing the Landau gauge fixing condition. Due to the superymmetric structure of the theory, two more composite operators, $A_\mu\gamma_\mu\lambda$ and $\bar{\lambda}\lambda$, related to the susy variations of A^2 are also introduced. A BRST invariant action containing all these operators is obtained. An all order proof of the multiplicative renormalizability of the resulting theory is then provided by means of the algebraic renormalization setup. Though, due to the non-linear realization of the supersymmetry in the Wess-Zumino gauge, the renormalization factor of the gauge field turns out to be different from that of the gluino.

Summary

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Session Classification: Tuesday Posters