



Contribution ID : 82

Type : Talk

## Non perturbative renormalization of flavor singlet quark bilinear operators in lattice QCD

*Wednesday, 27 July 2016 09:20 (20)*

We report on our studies of the renormalization of flavor singlet quark bilinear operators in lattice QCD. The renormalization constants are determined non-perturbatively using gauge field ensembles with  $N_f=2$  dynamical clover improved fermions. The renormalization is performed in the RI-MOM and RI-SMOM schemes. The difference between flavor singlet and non-singlet quark bilinear operators is a disconnected contribution, which has to be evaluated by stochastic estimators. We compare our results with perturbation theory.

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**Session Classification :** Standard Model Parameters and Renormalization

**Track Classification :** Standard Model Parameters and Renormalization