

Progress in the lattice simulations of $Sp(2N)$ gauge theories

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We report on the status of our program to simulate $Sp(2N)$ gauge theories on the lattice. Motivated by the potential realization of $SU(4)/Sp(4) \sim SO(6)/SO(5)$ composite Higgs model, we first consider $Sp(4)$ theories with two Dirac fermion flavors in the fundamental representation. Preliminary results of meson spectrum will be presented along with discussion of the lattice systematics. Toward partial top compositeness in which additional fermions carry $SU(3)$ color quantum numbers we implement two-index antisymmetric Dirac fermions and explore the phase space of bare lattice parameters. We also present preliminary results of string tension and glueball mass spectrum in pure $Sp(6)$ gauge theory. For all the numerical simulations we use the standard Wilson lattice gauge and fermion actions.

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