

1. Consider $SO(N_c)$ with $N_f = 1$ matter field $Q \in \mathbf{N}_c$. Convince yourself that, up to $SO(N_c)$ gauge rotations, the general expectation value is $\langle Q \rangle = (a + ib, ic, 0, \dots, 0)$, with a, b, c all real. Show that the $SO(N_c)$ D terms vanish iff $ac = 0$. What is the complex dimension of the classical moduli space? What are the independent gauge invariant operators? Verify that the dimension of the classical moduli space agrees with the Higgs mechanism counting.
2. Consider $SO(N_c)$ with N_f matter fields $Q_f \in \mathbf{N}_c$, for $f = 1 \dots N_f$. Suppose $N_f < N_c$. What are the independent gauge invariant monomials of chiral superfields? What can the gauge group be Higgsed to? Verify that the Higgs counting agrees.