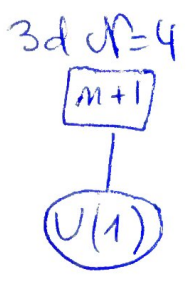


3d Mirror Symmetry (307207)

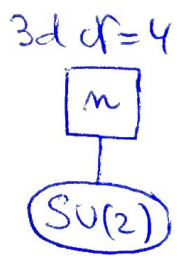
EXAMPLE 1



A_n global

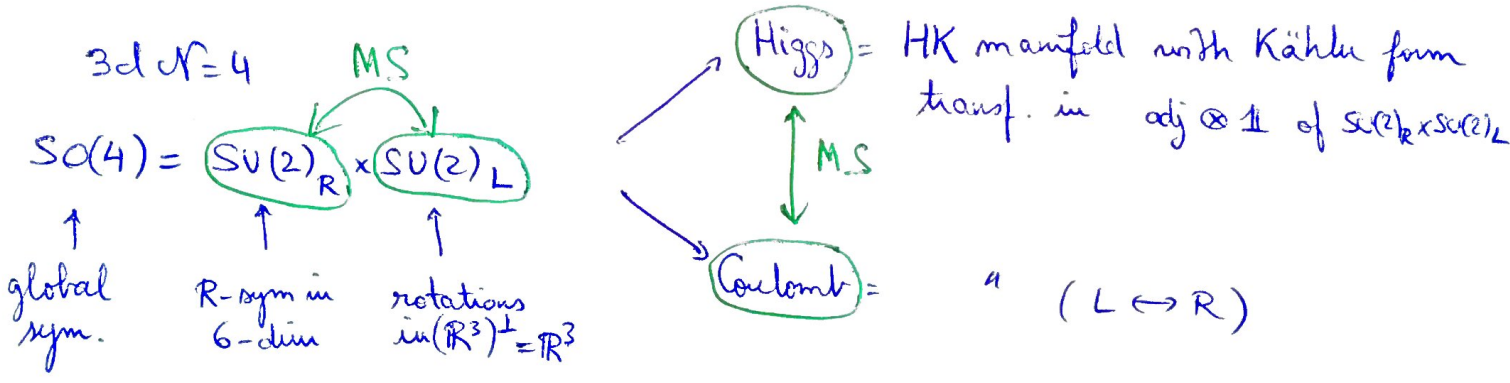
Higgs branch = moduli space of A_n instantons
 Coulomb branch with A_n singularity

EXAMPLE 2



D_n global
 (because $SU(2) = Sp(1)$)

Higgs = moduli space of D_n instantons
 Coulomb has D_n singularity



Non-renormalization theorems. Look at various couplings:

- Gauge coupling \Rightarrow Scalars transform under $SU(2)_L$.
 Consequence: Higgs branch not renormalized by quantum effects
- Mass terms \Rightarrow transform in $SU(2)_L \Rightarrow$ affect metric on Coulomb only
- FI terms \Rightarrow transform in $SU(2)_R \Rightarrow$ affect metric on Higgs only

Consequence: Quantum effects in one theory arise classically in the dual, and vice-versa.

The example of Kronheimer theories

$G = \text{ADE group}$.

3d $\mathcal{N}=4$ theory
defined by extended
 G quiver

Higgs branch = \mathbb{C}^2/Γ_G ($\dim_{\mathbb{H}} = 1$)

Coulomb branch = moduli space of a G instanton
($\dim_{\mathbb{H}} = h_G^{\vee} - 1$)

More precisely, the gauge
group is
 $K_G = \frac{\prod_{i=0}^n U(n_i)}{U(1)}$ — Dynkin
indices

Intersection Higgs \cap Coulomb :

interacting fixed point with
accidental G global symmetry
visible at long distance.

\hookrightarrow These theories for $G = A_n, D_n$ are dual to the examples above.