S^1 compactification of 6d SCFTs

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Introduction

Would like to study the properties of mysterious **6d SCFTs**

In particular, how they behave under **compactification** over various manifolds

S^1 compactification (to **5d theory**) is most simple

But the outcome is very rich

Well known (?) fact is⋯⋯

6d N=(2,0) SCFT of type G

Compactly on S^1
w/ radius R_6

vector multiplet
with gauge group G $+$ hypermultiplets in
adjoint rep of G

$$\frac{1}{g^2} = \frac{1}{R_6}$$ **IR free**

(5d maximal SYM)

Aim: generalize this result to 6d N=(1,0) SCFTs

Our Claim

6d N=(1,0) SCFT that is Higgsable to 6d N=(2,0) SCFT of type G

Compactly on S^1 w/ radius R_6

vector multiplet with gauge group G + 5d N=1 SCFT with flavor symmetry G
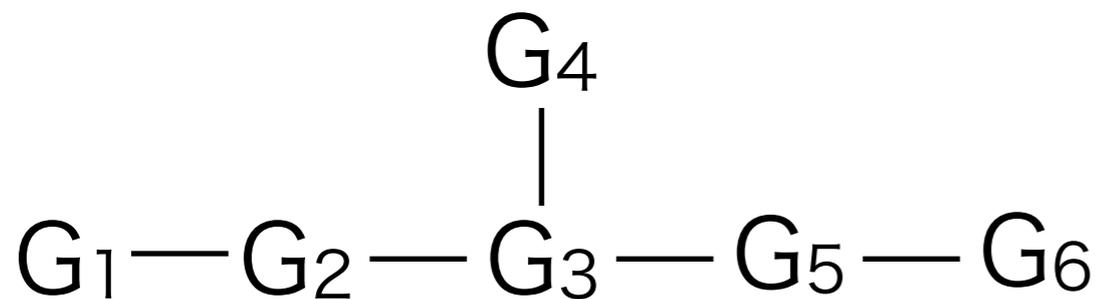
$$\frac{1}{g^2} = \frac{1}{R_6}$$ **IR free**

6d theory

6d N=(1,0) SCFT that is Higgsable to
6d N=(2,0) SCFT of type G

tensor branch
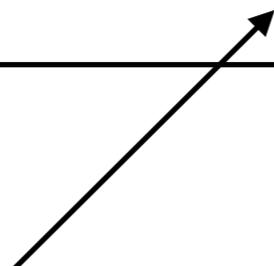deformation

Quiver gauge theory

Dynkin diagram of type G

$$G_1 - G_2 - G_3 - G_5 - G_6$$
$$|$$
$$G_4$$

E_6 Dynkin diagram

5d theory
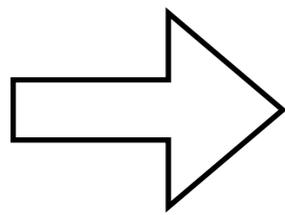
vector multiplet
with gauge group G
$+$
5d N=1 SCFT with
flavor symmetry G
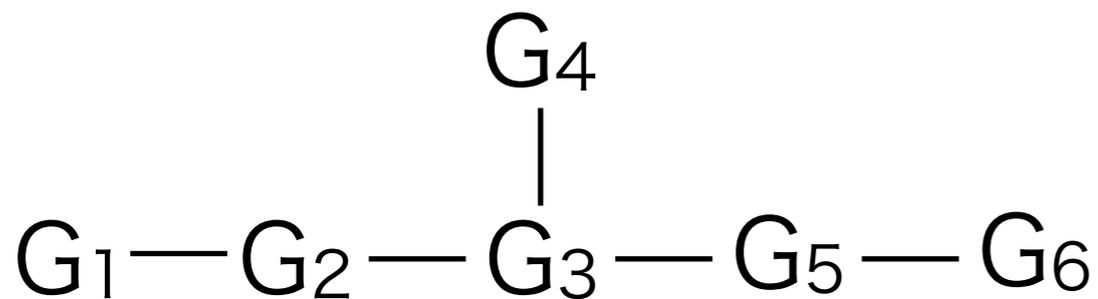
<u>Q</u>. What is this 5d SCFT ?

<u>On tensor branch of the **6d** SCFT······</u>

We have Dynkin quiver gauge theory

⟹ Consider the same quiver and

corresponding **5d** quiver gauge theory

$$G_4$$
$$|$$
$$G_1 — G_2 — G_3 — G_5 — G_6$$

UV fixed point

5d SCFT   with global symmetry G

instanton symmetry $U(1)^{rank(G)} \longrightarrow G$

Conclusions

S^1 compactification of 6d N=(1,0) SCFT that is Higgsable to 6d N=(2,0) SCFT

IR free vector multiplet   +   5d N=1 SCFT

UV fixed point of 5d quiver gauge theory
· quiver from tensor branch of 6d theory
· global symmetry enhancement