

Branes Wrapped on Orbifolds and Holography

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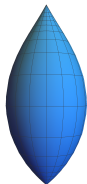
based on works with Federico Faedo and Dario Martelli

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New Frontiers in Theoretical Physics

28/09/2023

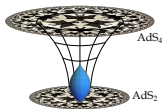
- based on [2210.16128](#) and [2310.xxxxx](#) with Federico Faedo and Dario Martelli;
- $WCP^1_{[p,q]} = \text{"Spindle"} \equiv \Sigma$:



- found in the NHL of 4-dim accelerating BHs;
- Supersymmetry can be realized in a novel way:

$$\text{top-twist : } \int_{\Sigma} F_R = \frac{p+q}{pq} = \chi$$

$$\text{anti top-twist : } \int_{\Sigma} F_R = \frac{p-q}{pq}$$



- AdS in the horizon \rightarrow CFT predictions. In particular:

- $S_{BH} = \frac{A_{hor}}{4}$;
- (Legendre trans. of) BH on-shell action;

must coincide.

- Difficult for complicated solutions: $AdS \times \Sigma_g \times \Sigma$, $AdS \times \Sigma_1 \times \Sigma_2$, $AdS \times M_4 \dots$
- BH not always known!

$$ds^2_{M_4} = A_{ij} d\phi^i d\phi^j + B_{ij} dy^i dy^j$$

where $A_{ij} = A_{ij}(y^i)$.

- Should compute the localized partition function... (done recently for $S^1 \times \Sigma$ in [2303.14199](#))

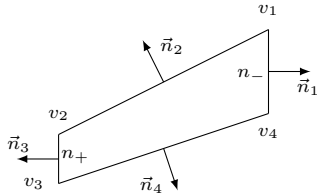
- For toric orbifolds we conjectured an **off-shell free energy**

$$F(\varphi_i, \epsilon_i; \mathbf{p}_i^a) \propto \sum_a \frac{\eta_d^a}{d_{a,a+1}} \frac{\mathcal{F}_d(\Phi_i^a)}{\epsilon_1^a \epsilon_2^a}$$

$$\Phi_i^a = \varphi_i - \mathbf{p}_i^a \epsilon_1^a - \mathbf{p}_i^{a+1} \epsilon_2^a$$

$$\epsilon_1^a = -\frac{\det(\vec{n}_{a+1}, \vec{\epsilon})}{d_{a,a+1}}$$

$$\mathcal{F}_d(\Phi_i^a) \propto (\Phi_1^a \Phi_2^a)^{(d-3)/2}$$



- Our conjecture has been demonstrated in some cases (see [2308.10933](#), [2309.04425](#))

Sporadic dualities from tensor deconfinement



CONVEGNO NAZIONALE DI FISICA TEORICA

2023



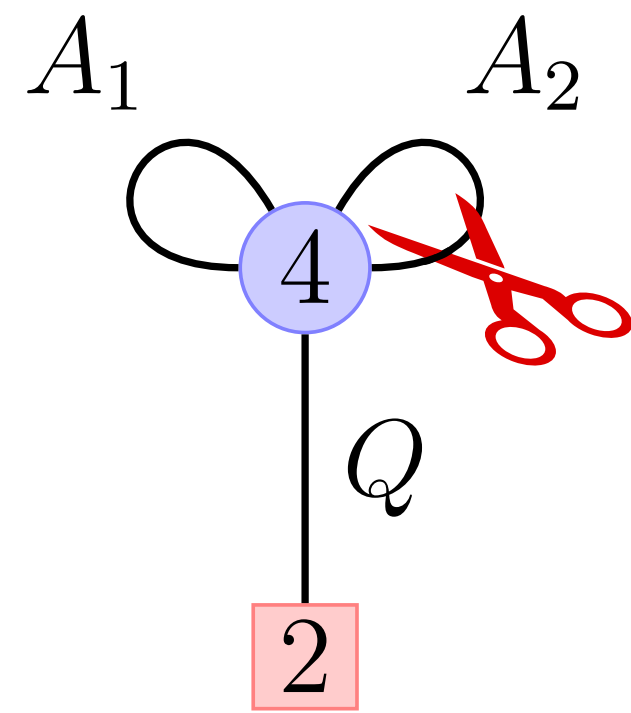
Istituto Nazionale di Fisica Nucleare



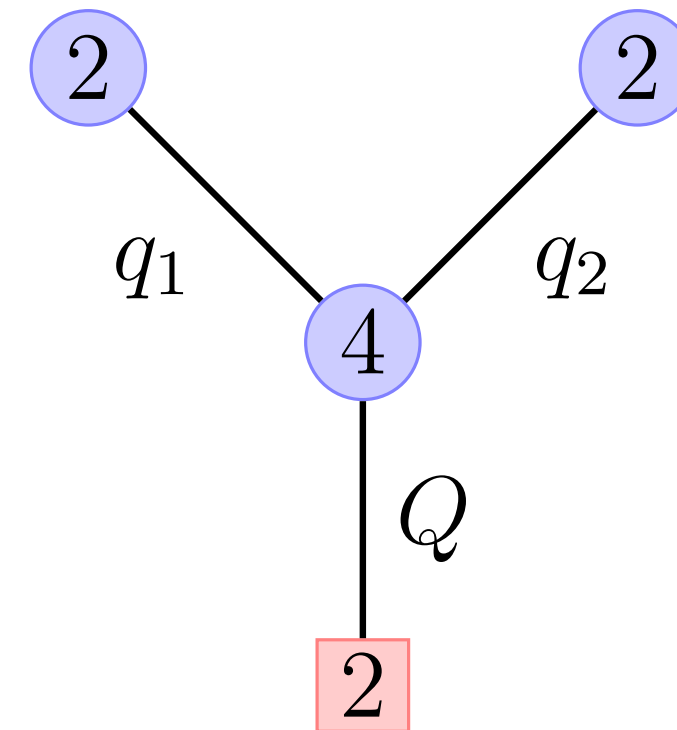
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Sporadic dualities from tensor deconfinement



Deconfining A-symm
 Berkooz [hep-th/9505067];
 Bottini, Hwang, Pasquetti,
 Sacchi [2201.11090];
 Bajicot, Benvenuti [2201.11049]



$$W = 0$$

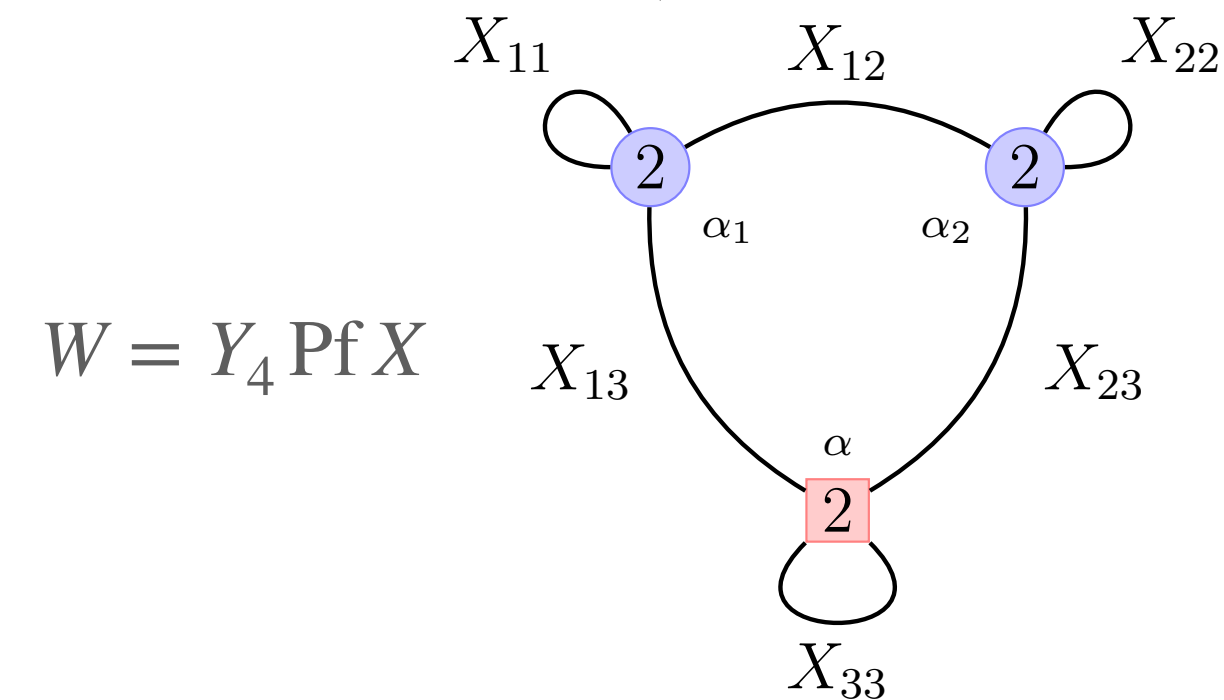
$$W = \sum_{I=1,2} s_I \text{Pf } A_I$$

Okazaki, Smith
 [2308.14428]

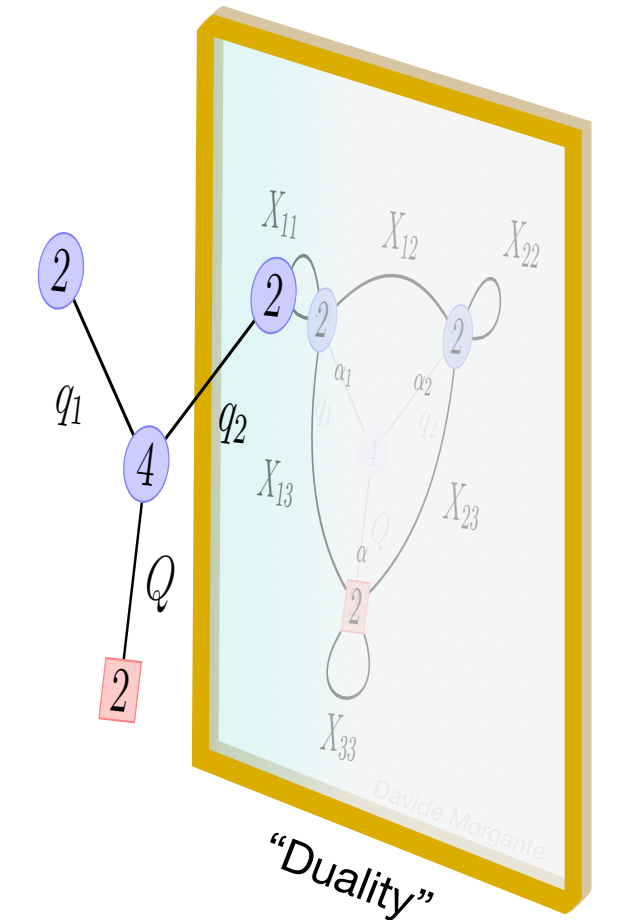
$$W \sim B_I B_J \phi_{IJ} + (M \phi_I B_I + M \phi_{IJ})^2 + \det B_{\alpha\beta}$$

	$SU(2)_A$	$SU(2)_a$	$U(1)_A$	$U(1)_a$	$U(1)_R$
M	1	1	0	2	0
$B_{\alpha\beta}$	1	3	2	2	0
ϕ_{IJ}	3	1	2	0	0
ϕ_I	2	1	1	0	0
B_I	2	1	1	2	0
\mathcal{T}_4	1	1	-4	-4	2

Duality on $Usp(4)$
 Aharony
 [hep-th/9703215]



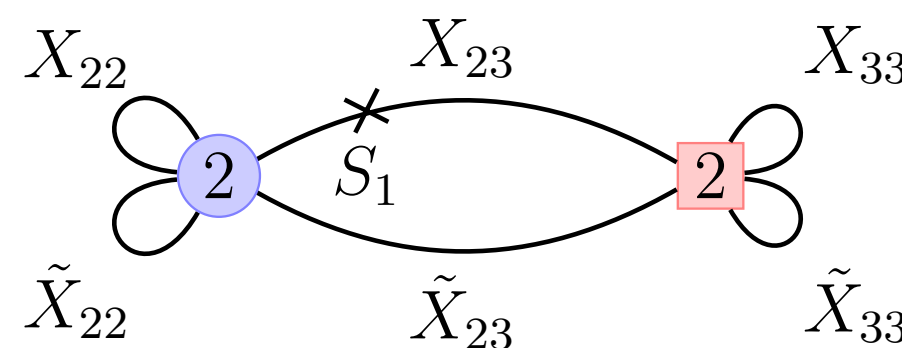
$$W = Y_4 \text{Pf } X$$



$$W \sim Y_4 \text{Pf } X + Y_2 \text{Pf } \tilde{X}$$

Aharony
 [hep-th/9703215]

Duality on $Usp(2)$



Aharony
 [hep-th/9703215]

Duality on $Usp(2)$