0.1 Mass deformations

In the following, we consider the coset with $n = 1$, i.e. a single vector multiplet. The coset representative is expressed in terms of four scalars $\phi^i, i = 0, 1, 2, 3$ via

$$L = \prod_{i=0}^{3} e^{\phi^i K^i} \tag{1}$$

where K^i are the non compact generators of $SO(4,1)$; see for details. Note that ϕ^0 is an $SU(2)_R$ singlet, while the other three scalars ϕ^r form an $SU(2)_R$ triplet. The scalar potential for this specific case can be obtained from and takes the following form

$$\begin{aligned} V(\sigma, \phi^i) = -g^2 e^{2\sigma} + \frac{1}{8} m e^{-6\sigma} \Big[& -32 g e^{4\sigma} \cosh\phi^0 \cosh\phi^1 \cosh\phi^2 \cosh\phi^3 + 8m \cosh^2\phi^0 \\ & + m \sinh^2\phi^0 \Big(-6 + 8\cosh^2\phi^1 \cosh^2\phi^2 \cosh(2\phi^3) + \cosh(2(\phi^1 - \phi^2)) \\ & + \cosh(2(\phi^1 + \phi^2)) + 2\cosh(2\phi^1) + 2\cosh(2\phi^2) \Big) \Big] \end{aligned} \tag{2}$$

The supersymmetric AdS_6 vacuum is given by setting $g = 3m$ and setting all scalars to vanish. The masses of the linearized scalar fluctuation around the AdS vacuum determine the dimensions of the dual scalar operators in the SCFT via

$$m^2 l^2 = \Delta(\Delta - 5) \tag{3}$$

where l is the curvature radius of the AdS_6 vacuum. For the scalars at hand, one finds

$$m_\sigma^2 l^2 = -6 \qquad m_{\phi^0}^2 l^2 = -4 \qquad m_{\phi^r}^2 l^2 = -6\ , \quad r = 1, 2, 3 \tag{4}$$

Hence the dimensions of the dual operators are

$$\Delta_{\mathcal{O}_\sigma} = 3, \qquad \Delta_{\mathcal{O}_{\phi^0}} = 4, \qquad \Delta_{\mathcal{O}_{\phi^r}} = 3\ , \quad r = 1, 2, 3 \tag{5}$$

In these CFT operators were expressed in terms of free hypermultiplets (i.e. the singleton sector). The case of $n = 1$ corresponds to having a single free hypermultiplet, consisting of four real scalars q_A^I and two symplectic Majorana spinors ψ^I. Here $I = 1, 2$ is the $SU(2)_R$ R-symmetry index and $A = 1, 2$ is the $SU(2)$ flavor symmetry index. The gauge invariant operators appearing in are related to these fundamental fields as follows,

$$\mathcal{O}_\sigma = (q^*)^A{}_I q^I{}_A, \qquad \mathcal{O}_{\phi^0} = \bar{\psi}_I \psi^I, \qquad \mathcal{O}_{\phi^r} = (q^*)^A{}_I (\sigma^r)_A{}^B q^I{}_B\ , \quad r = 1, 2, 3 \tag{6}$$

Note that the first two operators correspond to mass terms for the scalars and fermions, respectively, in the hypermultiplet. The third operator is a triplet with respect to the