Review of 'States, symmetries and correlators of $T\bar{T}$ and $J\bar{T}$ symmetric orbifolds'

The authors of this paper studied the effect of single-trace $T\bar{T}$ and $J\bar{T}$ deformations on symmetric orbifold theories. Specifically, new results include:

- A generalization of the formulae of Bantay to symmetric obrifolds of arbitrary QFTs.
- Demonstrating that the Vir $\times$ Vir ($\ltimes$ Kac-Moody^2) symmetry of symmetric orbifold CFTs remain in-tact after performing single-trace $T\bar{T}$ and $J\bar{T}$ deformations, generalizing known results for double-trace $T\bar{T}$ and $J\bar{T}$ deformations.
- Computing momentum space correlation functions of single-trace $T\bar{T}$ and $J\bar{T}$ deformed symmetric orbifolds.

I wholly recommend this article be published in SciPost, provided the following comments are addressed:

- Since the article contains a large number of new results, but also a large amount of review of old results, it would be helpful if the authors could be very clear about which subsections should be taken as new results, and which are simply review. As far as I can tell, this list includes Sections 2.2, 2.3, 2.4, 3.3, 3.4, and 4.2.
- In Section 2.2, it should be mentioned that an explicit choice of metric on the torus has been chosen:
$$\mathrm{d}s^2 = R(\mathrm{d}x^2 + \mathrm{d}y^2)\,, \quad (x,y) \sim (x+1,y) \sim (x+\tau_1, y+\tau_2)\,,$$
i.e. a metric which is globally flat and for which the radius of the A-cycle is R and the B-cycle has radius $R|\tau|$. While in a CFT one can fix the torus metric to be flat, this is not always possible in a generic QFT. It would actually be interesting to study the torus partition function of a QFT on a torus with generic metric g. A natural guess would be
$$Z^{S_N}(\Sigma, g) = \exp\left(\sum_{\gamma:\Sigma'\to\Sigma} \frac{p^{\deg(\gamma)}}{|\mathrm{Aut}(\gamma)|} Z(\Sigma', \gamma^* g)\right)$$
where the sum is over covering spaces Σ' equipped with the pullback metric $\gamma^* g$.
- Equation (2.36) contains an extra factor of $|\xi|$ compared to equation (6) of [34].
- This is merely an aesthetic issue, but words which appear in equations should be in \text mode (specifically the subscripts in Section 2.4).
- On the top of page 44: 'its dynamics is...' should read 'its dynamics are...'.
- The sentence below equation (4.32) is hard to read, and should probably be divided into two sentences.