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Referee report

Opinion (JHEP_252P_0420_v3): We consider that the author implemented the modifications with good criteria. The current version is significantly more readable and consistent. We only have minor comments and a few important questions that still puzzle us. Therefore; we suggest a minor revision following the points listed below before publication.

1. Important comments:

   (a) Flow equation have the form (using $\alpha_l = a_l e^{ib_l}$ and $\tau = \epsilon^2 t$)

   $$2iw_l \frac{d\alpha_l}{d\tau} = \sum\sum C_{ijkl}\alpha_i\alpha_j\bar{\alpha}_k + (\text{non-normlizable terms})\,, \quad (1)$$

   where the first term on the RHS represents the normalizable terms. However, we still find a comment under (3.7) describing the solution of (3.7) without taking into account the normalizable terms (which provide the main contributions). Something similar happens in section 4, in the third paragraph. There the author claims that under the conditions that lead to (3.7) the flow equations decouple, however they are still strongly coupled due to terms involving normalizable modes.

   (b) Terms $w_i + \bar{w} - \bar{w} = w_l$ (terms (3.6)) in sections 3.2 and 3.3:
   We observe that terms associated with the resonances $w_l = w_l + \bar{w}_1 - \bar{w}_1$, $w_l = w_l + \bar{w}_2 - \bar{w}_2$ (terms (3.6)) are not included in

(3.18). Note that they cannot be contained in $\bar{T}_l A_1 A_2 a_l$ because the non-normalizable amplitudes must be A_1^2 and A_2^2.

The resonance condition $w_i + w_\gamma = w_\beta - w_l$ given in section 3.3.1 is not consistent with $\bar{R}^{(1)}_{\beta l}$ ($\gamma = \beta$). Note that γ and β denote non-normalizable modes and i and l normalizable modes. Therefore the resonance condition cannot be satisfied because $w_i > 0$. These terms belong to section 3.3.2 because they arise from the resonance:

$$w_l = w_i + w_\gamma - w_\beta. \tag{2}$$

Note that for every w_β the combination $\bar{R}^{(1)}_{\beta,l} + \bar{R}^{(2)}_{\beta,l}$ must be (3.6) (although the expressions of $\bar{R}^{(1)}_{\beta,l}$ and $\bar{R}^{(2)}_{\beta,l}$ do not allow a straightforward check).

(c) Appendix C: The introduction of this appendix requires clarification about the restriction on $\bar{w}$. This appendix apparently discusses the case $\bar{w} \in Z^+$ (integer frequencies), however the paragraph under (C.1) talks about $\bar{w} = w_l$ (normalizable frequencies). We believe that this appendix works under both restrictions, $\bar{w} \in Z^+$ and $\bar{w} \neq w_l$ because assuming $\bar{w} = w_l$ extra terms appear.

2. Minor comments and typos:

   (a) Abstract: "... any mass ...", the paper is restricted to $m^2_{BF} < m^2 \leq 0$, therefore the word "any" could be too strong.

   (b) Page 5, last sentence: [26] should be cited, this is another example of driven CFT and the closest connection with the current paper.

   (c) Page 6, under (2.17): "... receives AND extra ...", should "AND" be replaced by "AN"?

   (d) Page 8, under the title 2.3: the word "that" is duplicated.

   (e) Page 11, above 3.2: T_l should be replaced by $\bar{T}_l$.

   (f) Fig. 1 and 2: the y-label and the caption use $\bar{T}_l$ and S_l to describe the same object.

   (g) The RHS of (2.21-2.23) is not appropriate. In the case of (2.21), the expression is (see (42) and (46) in [17]):

$$\ddot{c}_l^{(3)} + \omega_l^2 c_l^{(3)} = S_l, \tag{3}$$

   where S_l is given by (2.20) (secular and non-secular terms). The use of S_l to denote both the source term $S_l = \langle S, e_l \rangle$ and its secular terms is quite confusing. For (2.22-2.23) the expressions should have the form given in (64-65) in [17]. The RHS can not be factorized in a polynomial in a_I times a trigonometric function.