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Introduction to String Theory

Group Project: Higher Spin Holography

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Outline Recently, Klebanov and Polyakov [1] conjectured a duality between Vasiliev's higher spin theory [2, 3] and the $\mathcal{O}(N)$ vector model (find a reference) at its two isolated critical points. A check of the three-point functions was provided in [4].

A similar but distinct duality was suggested for AdS_3/CFT_2 in [5]. For a nice presentation of this case see [6]. While the previous works dealt with $SL(N) \times SL(N)$, while a recent work [7] deals with infinitely many spins and $hs[\lambda] \times hs[\lambda]$.

Task 1 Write up a one-page-summary explainig the main idea of and recent progress on higher spin holography in the AdS_3/CFT_2 case.

Task 2 a) Derive equation (2.8) in [6].

b) Derive the operator product expansion (2.11) in [6]. Compare also (4.26), (2.22), (4.10), (4.17), and (4.18) in [5].

c) Could you also work out such an operator product expansion for other groups (e.g. exceptional Lie groups)?

References

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[7] M. R. Gaberdiel and R. Gopakumar, *An AdS3 Dual for Minimal Model CFTs*, *Phys.Rev.* **D83** (2011) 066007, [arXiv:1011.2986].