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Superconformal blocks for stress tensor and chiral operator for 4D $\mathcal{N} = 2$ SCFT

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The superconformal bootstrap program for $\mathcal{N} = 2$ superconformal field theories was initiated by Rastelli.et.al. The main ingredient for bootstrapping any CFTs is a four point function and which can be expressed interms of conformal partial waves. In this work we have computed the superconformal partial waves of the four-point correlator $\langle JJ\Phi\Phi^\dagger\rangle$, in which the external operator J is the superconformal primary of the 4D $\mathcal{N} = 2$ stress-tensor multiplet and Φ is primary operator of chiral multiplet . We have used full fledged superembedding formalism for our work. In $\mathcal{N} = 2$ SCFTs, the three-point functions $\langle JJO\rangle$ and $\langle\Phi\Phi^\dagger\mathcal{O}\rangle$ with general multiplet $\mathcal{O}$ contain two independent nilpotent superconformal invariants and new superconformal tensor structures, which can be nicely constructed from variables in superembedding space, and the three-point functions can be solved in compact forms. We computed the superconformal partial waves corresponding to the exchange of long multiplets where the result for odd spin is consistent with non trivial constraints by the decompositions of $\mathcal{N} = 2$ multiplet into several $\mathcal{N} = 1$ multiplets.

References

1. F. Dolan and H. Osborn, Conformal four point functions and the operator product expansion, Nucl.Phys. B599 (2001) 459–496, [hep-th/0011040].
2. F. Dolan and H. Osborn, Conformal partial waves and the operator product expansion, Nucl.Phys. B678 (2004) 491–507, [hep-th/0309180].
3. F. Dolan and H. Osborn, Conformal Partial Waves: Further Mathematical Results, arXiv:1108.6194.
4. C. Beem, L. Rastelli and B. C. van Rees, Phys. Rev. D 96, no. 4, 046014 (2017) doi:10.1103/PhysRevD.96.046014 [arXiv:1612.02363] .
5. N. Bobev, S. El-Showk, D. Mazac and M. F. Paulos, JHEP 1508, 142 (2015) doi:10.1007/JHEP08(2015)142 [arXiv:1503.02081 [hep-th]].
6. A. L. Fitzpatrick, J. Kaplan, Z. U. Khandker, D. Li, D. Poland and D. Simmons-Duffin, JHEP 1408, 129 (2014) doi:10.1007/JHEP08(2014)129 [arXiv:1402.1167 [hep-th]]
7. Z. U. Khandker, D. Li, D. Poland and D. Simmons-Duffin, JHEP 1408, 049 (2014) doi:10.1007/JHEP08(2014)049 [arXiv:1404.5300 [hep-th]].
8. Z. Li and N. Su, JHEP 1605, 163 (2016) doi:10.1007/JHEP05(2016)163 [arXiv:1602.07097 [hep-th]].
9. W. D. Goldberger, Z. U. Khandker, D. Li and W. Skiba, Phys. Rev. D 88, 125010 (2013) doi:10.1103/PhysRevD.88.125010 [arXiv:1211.3713 [hep-th]].
10. A. M. Polyakov, Nonhamiltonian approach to conformal quantum field theory, Zh. Eksp. Teor. Fiz. 66 (1974) 23–42.
11. R. Rattazzi, V. S. Rychkov, E. Tonni, and A. Vichi, Bounding scalar operator dimensions in 4D CFT, JHEP 0812 (2008) 031, [arXiv:0807.0004].
12. P. Liendo, I. Ramirez and J. Seo, JHEP 1602, 019 (2016) doi:10.1007/JHEP02(2016)019 [arXiv:1509.00033 [hep-th]]
13. Slava Rychkov,EPFL Lectures on Conformal Field Theory in D $\geq$ 3 Dimensions [arXiv:1601.05000]

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