

AdS/CFT correspondence and and classification of Kaluza-Klein modes within the supergroup

Tuesday, 24 September 2024 16:50 (5 minutes)

Within the framework of AdS/CFT correspondence we considered large N limits of conformal field theories in d dimensions which described in terms of supergravity on the product of AdS space with a compact manifold. An important example of such correspondence is equivalence between $N = 4$ super Yang-Mills theory in four dimensions and Type IIB superstring theory on $AdS_5 \times S^5$ [1]. The confirmation of this correspondence comes from the fact that the Kaluza-Klein modes of type IIB supergravity on $AdS_5 \times S^5$ coincide with the chiral operators of $N = 4$ super Yang-Mills theory in four dimensions. Moreover, to describe $N = 4$ super Yang-Mills theory in four dimensions, one should use low energy supergravity on AdS_5 and the infinite tower of massive Kaluza-Klein states on $AdS_5 \times S^5$ [2]. The supersymmetry group of $AdS_5 \times S^5$, is known to be the same as the superconformal group in 3+1 spacetime dimensions. So, the supersymmetries of Type IIB superstring theory on $AdS_5 \times S^5$ and Yang-Mills theory in four dimensions are given by the same superconformal group $SU(2,2|4)$. We presented the Kaluza-Klein masses and their multiplet classification corresponding to the superconformal group representations.

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2. Juan M. Maldacena. The Large N Limit of Superconformal Field Theories and Supergravity. Adv.Theor.Math.Phys.2:231-252,1998

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Session Classification: Poster Session

Track Classification: HIGH ENERGY PHYSICS AND NUCLEAR MATTER