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Ground state energy of the twisted AdS3 × S3 × T4 superstring and the TBA

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In the present work we address the Thermodynamic Bethe Ansatz and ground state energy of the $AdS_3 \times S_3 \times T_4$ model from the associated mirror superstring model in the pure RR background. Independently, we show complete consistency with wrapping interaction formalism and derive generalised Lüscher expression for GSE. We prove that the underlying mirror Y-system becomes solvable in various parametric regimes of the lightcone superstring theory. Moreover the contribution of the gapless worldsheet excitations coming from the T_4 can be computed exactly. Next we implement the lightcone $AdS_3 \times S_3 \times T_4$ superstring sigma model with twisted boundary conditions on the fields. It then allows us to find the ground state energy in the semi-classical approximation, where string tension h and lightcone momentum L are infinite (fixed ratio). Comparison of semi-classical results demonstrates that there is a full agreement with the computation from AdS_3 TBA. We also emphasize the massless factor discrepancy with respect to the initial conjecture arXiv:2112.08898 and show that it is related to the Y-functions and analytic structure describing massless modes. We also make a mixed flux proposal from the TBA and find complete correspondence with the computation from the $AdS_3 \times S_3 \times S_3 \times S_1$ lightcone superstring. Based on arXiv:2305.17128 and upcoming work.

Summary

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