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Two-loop cusp anomaly in ABJM at strong coupling

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We compute the null cusp anomalous dimension of ABJM theory at strong coupling up to two-loop order. This is done by evaluating corrections to the corresponding superstring partition function, weighted by the $AdS_4 \times CP^3$ action in AdS light-cone gauge. We compare our result, where we use an anomalous shift in the AdS_4 radius, with the cusp anomaly of $N=4$ SYM, and extract the two-loop contribution to the non-trivial integrable coupling $h(\lambda)$ of ABJM theory. It coincides with the strong coupling expansion of the exact expression for $h(\lambda)$ recently conjectured by Gromov and Sizov. Our work provides thus a non-trivial perturbative check for the latter, as well as evidence for two-loop UV-finiteness and quantum integrability of the Type IIA $AdS_4 \times CP^3$ superstring in this gauge. Based on arXiv:1407.4788.

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