1/4 BPS Wilson loops in AdS5xS5: does sigma-model perturbation theory meet localization?

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We study the strong coupling behaviour of 1/4 BPS latitude Wilson loops in N=4 SYM theory, computing the one-loop corrections to the relevant classical string solution in AdS5xS5 in sigma-model perturbation theory. The approach is based on the application of the Gel'fand-Yaglom method to compute the relevant functional determinants for the fluctuations of the type IIB Green-Schwarz action expanded around the minimal-area surface. We normalize the vev of the Wilson loops with respect to the 1/2 BPS circular case to circumvent the problem of determining the correct overall constant contribution from the normalization of ghost zero modes. We find a discrepancy with the result obtained via supersymmetric localization in the gauge theory and discuss some issues that might be responsible for this outcome.

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