In this article, analyticity of planar amplitudes in $\mathcal{N} = 4$ super Yang-Mills (SYM) theory is investigated. The motivation of the study is to understand the relations of the SYM theory to string theory. This is why the amplitudes of interest are limited to the planar cases but it also enables the analysis in the Regge limits by use of recently developed relations on the planar amplitudes. More precisely, the authors utilize the so-called Bern-Dixion-Smirnov (BDS) ansatz for the $\mathcal{N} = 4$ SYM amplitudes [1] to analyze an analytic behavior of the planar amplitudes in the multi-Regge limits, and compare it with a counterpart of flat-space string theory. It is concluded that two theories have different properties in the Regge limits. Detailed calculations and discussions are presented in support of this result. Interested readers should also refer to an accompanied paper [2] by the same authors where computational techniques used in the analysis are initially developed.

References

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