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Grassmannians and form factors

Nowadays massless maximally supersymmetric Yang-Mills theory (N=4 SYM) is very intensively studied. During the past decade, a very significant and stunning progress has been achieved in computing of different quantities and general understanding of the S-matrix of this theory. Due to powerful computational methods, such as BCFW recursion, generalized unitarity, on-shell diagram formalism and many others, rather exotic geometric structures have been discovered to underlie the S-matrix: Grasmannian integral for tree-level amplitudes, Amplituhedron for loop amplitudes, etc. Moreover, it turned out that some of these results could successfully be derived within so-called Ambitwistor string theory. In my report, I would like to discuss how all these results can be generalized to form factors - objects, that are partially off-shell and hence a bit more complicated compared with scattering amplitudes. We will consider a very general method, which allows to derive results for form factors starting with those for the amplitudes and show how it works on some particular examples.

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