An idea of "momentum-twistor" space is proposed in [1] as a useful and economical tool for the calculation of gluon amplitudes, stimulated by recent development of this subject in relation to, in particular, twistor space, dual conformal symmetry and Grassmannian geometry. This article reports further studies of the momentum-twisor approach in the computation of one-loop amplitudes. To be more specific, explicit calculations of the box integrals are presented by use of momentum-twistor parameters. The interested readers should also refer to a closely related article [2].

Besides technical details, this article also discusses underlying geometric features of the twistor and momentum-twistor spaces. Notably, it reviews the fact that skew bi-twistors in $\mathbb{CP}^5$, corresponding to coordinates on complexified Minkowski space, satisfy the so-called quadric relation, meaning that the skew bi-twistor defines the Klein quadric on $\mathbb{CP}^5$. Twistor contour integrals and, hence, scattering amplitudes can then be interpreted in the language of $\mathbb{CP}^5$. Together with the dual conformal symmetry, this feature turns out to be suitable to handle spurious singularities in gluon amplitudes. The momentum-twistor space receives much attention recently in studies which seek for unified understanding of scattering amplitudes in gauge theories; see, *e.g.*, [3].

References

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[2] L. Mason and D. Skinner, J. Phys. A **44**, 135401 (2011) [arXiv:1004.3498 [hep-th]].

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