This article presents an alternative analytic technique for the calculations of one-loop amplitudes in the unitary-cut method [1, 2]. The proposed technique utilizes a single-cut, rather than conventional double-cut, approach to the one-loop calculations. It is argued that the single-cut method is useful to evaluate tadpole integrals, in particular, which are necessary for the one-loop calculations in general. Possible applications of these results are also discussed in the paper.

The unitary-cut method has provided a set of remarkable results for systematic computations of loop amplitudes. It is by now a well established subfield of particle physics. What the reader should bear in mind is, however, that the unitary-cut method has a limit in its validity, *i.e.*, it is applicable only for planar amplitudes. This is largely due to the fact that the method has been developed, in part, borrowing calculatory techniques from open string theory [1, 2]. This point is often implicit in recent literature, and so is it in this article. It probably goes without saying but, in considering extension of the unitary-cut method and particularly applying it to practical problems, it is advisable for the reader to be conscious of this point.

References

[1] Z. Bern, L. J. Dixon, D. C. Dunbar and D. A. Kosower, Nucl. Phys. B **425**, 217 (1994) [hep-ph/9403226].

[2] Z. Bern, L. J. Dixon, D. C. Dunbar and D. A. Kosower, Nucl. Phys. B **435**, 59 (1995) [hep-ph/9409265].