Reply to comment regarding ‘special-case closed form of the Baker–Campbell–Hausdorff formula’

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In his comment [1] on our article [2], Lo adapts the Wei–Norman technique [3] to obtain an alternative derivation of our central result. While the analysis in the Comment is mathematically valid, the author is not actually obtaining any new results, he just has a slightly different way of getting to the same results. While he does not have to do any series summation, instead he (somewhat sketchily) solves some nonlinear differential equations. Whether or not solving nonlinear differential equations is in any sense ‘easier’ than summing a series is questionable. More subtly, it is less than clear whether this appeal to the Wei–Norman technique can be further generalized. For instance, in reference [4] we have considerably weakened the input assumptions required to obtain our central result, and the Wei–Norman technique does not appear to be usable in that context.

References

[1] Lo C F Comment on special-case closed form of the Baker–Campbell–Hausdorff formula J. Phys. A: Math. Theor. 49 218001
[2] Van-Brunt A and Visser M 2015 Special-case closed form of the Baker–Campbell–Hausdorff formula J. Phys. A: Math. Theor. 48 225207
[3] Wei J and Norman E 1963 Lie algebraic solution of linear differential equations J. Math. Phys. 4 575
[4] Van-Brunt A and Visser M 2015 Explicit Baker–Campbell–Hausdorff formulae for some specific Lie algebras arXiv:1505.04505 [math-ph]