In this article the authors calculate a certain product of Wilson line operators in 3-dimensional Chern-Simons theory, following the previous study [1], to indicate that the product can be represented by a co-product defined in a quantized universal enveloping algebra or a quantum group. The results are obtained within the leading order in perturbative calculation of the product. The results provide a concrete mathematical tool to explore relations between quantum groups and Chern-Simons theory. This study would also be useful in further understanding of interrelations among braid groups, Chern-Simons theory, and Wess-Zumino-Witten model.

References

[1] N. H. Aamand, Lett. Math. Phys. **111**, no.6, 146 (2021) doi:10.1007/s11005-021-01485-z [arXiv:1905.03263 [hep-th]].