Supplement of

An advanced method of contributing emissions to short-lived chemical species (OH and HO_2): The TAGGING 1.1 submodel based on the Modular Earth Submodel System (MESSy 2.53)

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This document provides additional material to the article: Rieger et al., An advanced method of contributing emissions to short-lived chemical species (OH and HO₂): The TAGGING 1.1 submodel based on the Modular Earth Submodel System (MESSy 2.53), 2017. The following figures compare the contributions of the tagging method V1.0 and the advanced tagging method V1.1 for the ten source categories: emissions from anthropogenic non-traffic (e.g. industry and households), road traffic, ship traffic, air traffic, biogenic sources, biomass burning, lightning, methane and nitrous oxide decomposition and stratospheric ozone production.



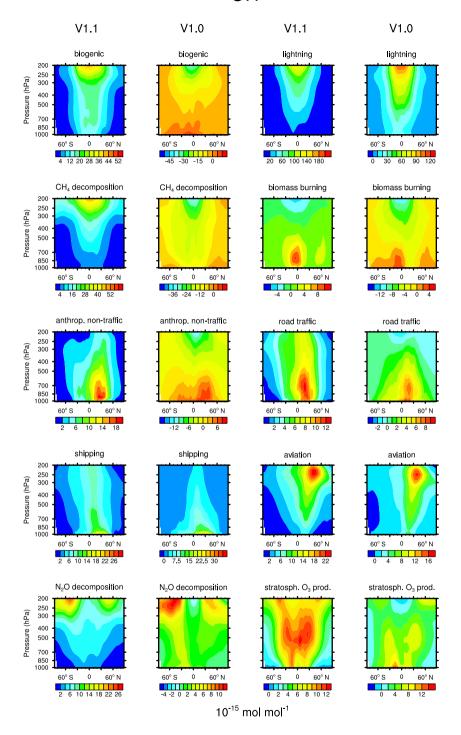


Figure 1. Comparison of tagging method V1.1 and V1.0 for OH. First and third columns show the tagging method V1.1. Second and forth columns show the tagging method V1.0.

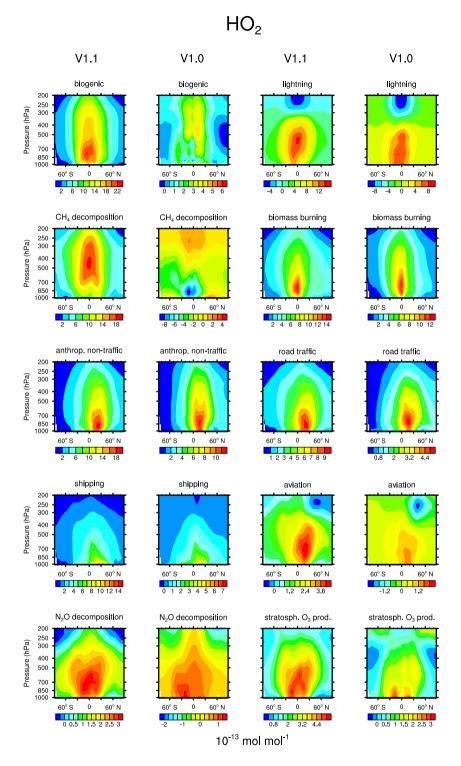


Figure 2. Comparison of tagging method V1.1 and V1.0 for HO_2 . First and third columns show the tagging method V1.1. Second and forth columns show the tagging method V1.0.

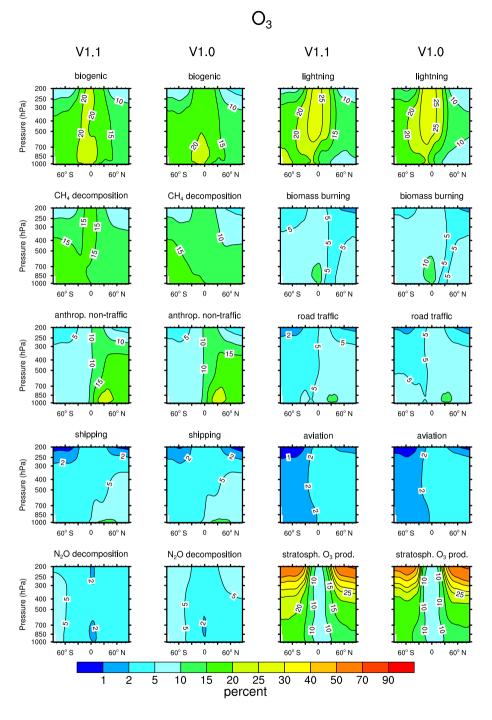


Figure 3. Comparison of tagging method V1.1 and V1.0 for O_3 . First and third columns show the tagging method V1.1. Second and forth columns show the tagging method V1.0.

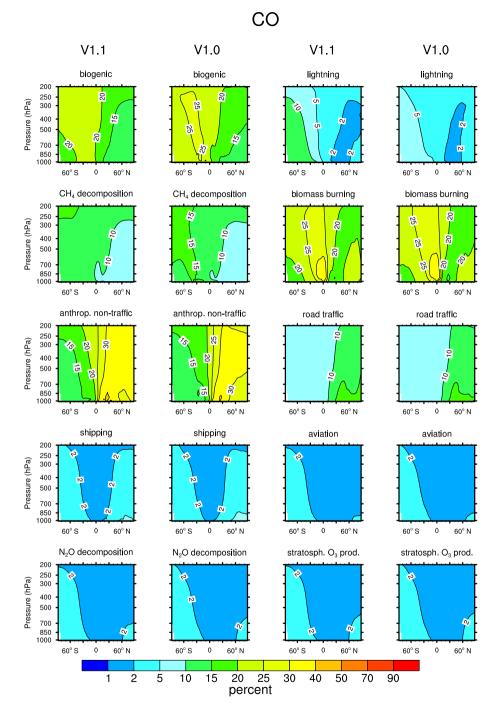


Figure 4. Comparison of tagging method V1.1 and V1.0 for CO. First and third columns show the tagging method V1.1. Second and forth columns show the tagging method V1.0.

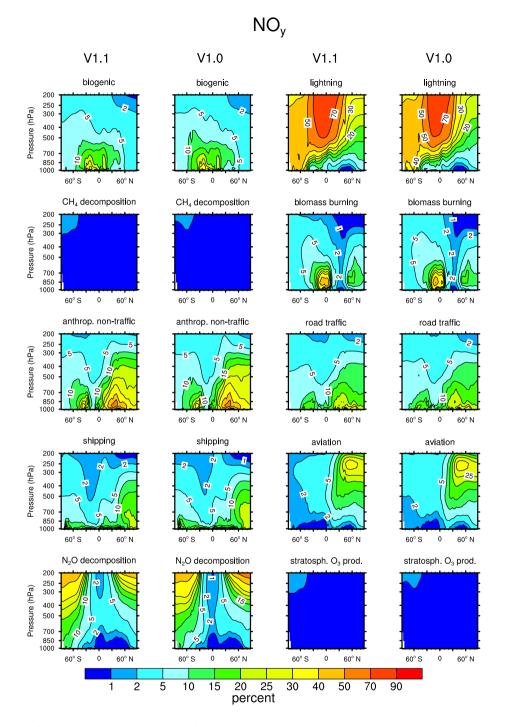


Figure 5. Comparison of tagging method V1.1 and V1.0 for NO_y . First and third columns show the tagging method V1.1. Second and forth columns show the tagging method V1.0.

NMHC V1.1 V1.0 V1.1 V1.0 biogenic lightning biogenic lightning 200 Pressure (hPa) 300 400 500 700 60° N 60° S 0 CH₄ decomposition CH₄ decomposition biomass burning biomass burning 250 300 Pressure (hPa) 400 500 700 850 1000 60° N 60° S 60° N 60° S 60° S 60° S 60° N anthrop. non-traffic anthrop. non-traffic road traffic road traffic 200 Pressure (hPa) 300 400 500 700 850 1000 0 60° N 60° S 60° N 60° S 60° N 60° S 60° S 0 0 60° N shipping shipping aviation aviation 200 250 300 Pressure (hPa) 400 500 700 850 1000 60° N N₂O decomposition stratosph. O₃ prod. stratosph. O₃ prod. N₂O decomposition 200 250 300 Pressure (hPa) 400 500 700 850 1000 60° S 0 60° N 20 25 percent 2 5 10 15 30 40 50 70 90

Figure 6. Comparison of tagging method V1.1 and V1.0 for NMHC. First and third columns show the tagging method V1.1. Second and forth columns show the tagging method V1.0.

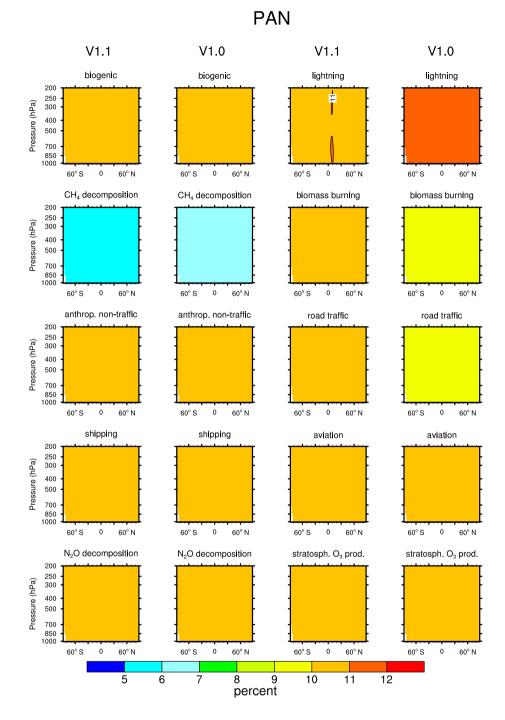


Figure 7. Comparison of tagging method V1.1 and V1.0 for PAN. First and third columns show the tagging method V1.1. Second and forth columns show the tagging method V1.0.