Supplement

Figures S1 to S3.

Ozone mixing ratio observed from the R/V *Mirai* during seven research cruises during 2014–2018 are presented in Figure S1. Minimum concentrations of O_3 were observed over the tropical western Pacific. Correlation between O_3 and IO simulated by two global chemistry-transport models over the tropical western Pacific are shown in Figures S2 and S3. In the low ozone concentration range (e.g., <12 ppb), positive correlations between ozone and IO concentrations were evident for the two global chemistry-transport models including halogen chemistry, where the "O_3-dependent" flux was dominant.

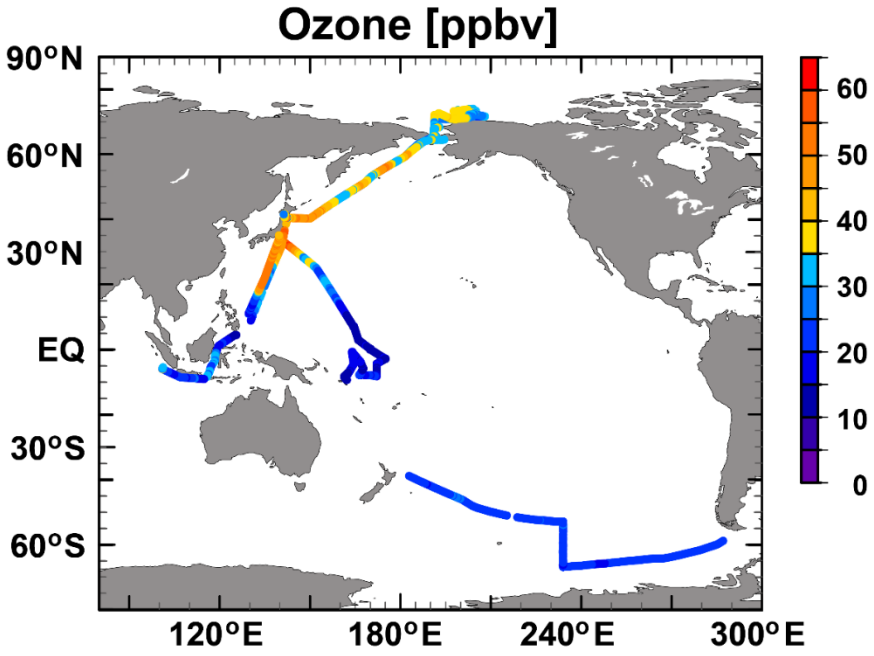

Figure S1: Ozone mixing ratio [ppbv] observed from the R/V *Mirai* cruises presented in Table 1 during 2014–2018.

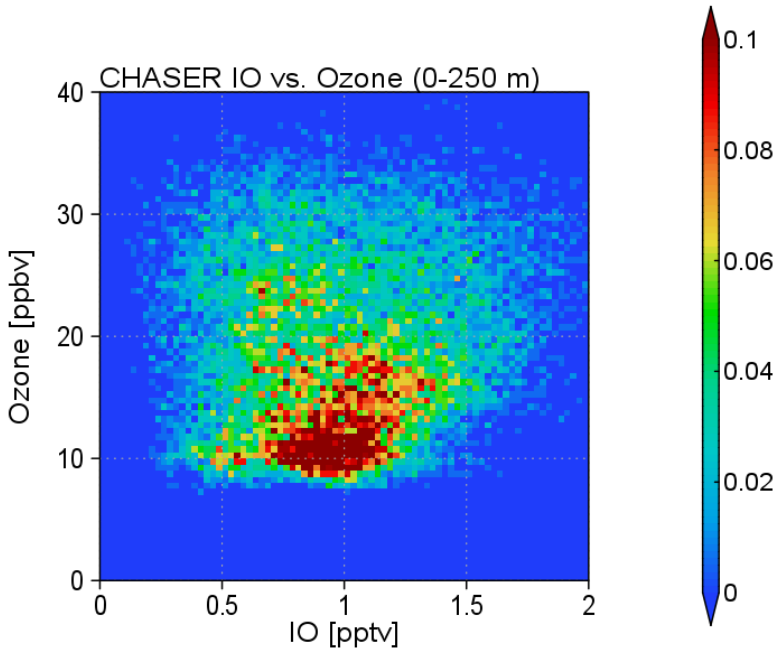

Figure S2: Two-dimensional histogram [%] as a function of IO volume mixing ratio [pptv] and ozone mixing ratio [ppbv] for 0–250 m altitudes simulated by a global chemical model (Sekiya et al., 2020) during the observation period (Nov–Dec 2014) over the tropical western Pacific (0–15°N, 150–165°E).

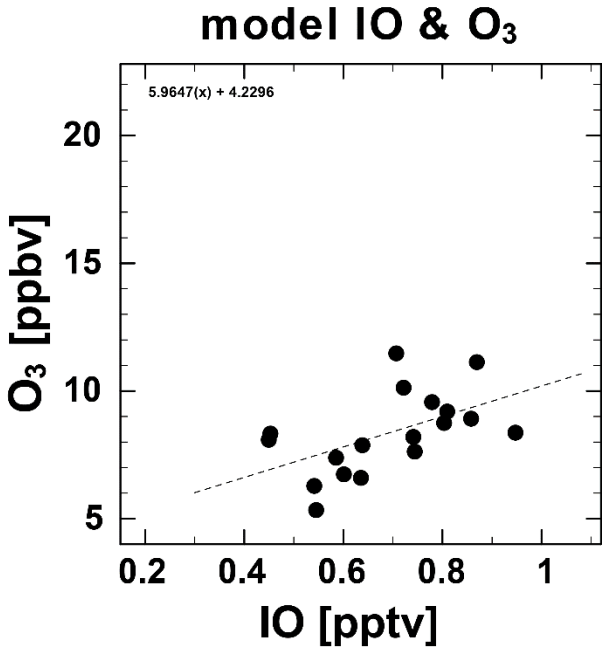

Figure S3: Scatterplot of IO mixing ratio [pptv] and ozone mixing ratio [ppbv] simulated by global chemical model (Saiz-Lopez et al., 2014) along the cruise track (MR14-06) over the tropical western Pacific.

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References

Saiz-Lopez, A., Fernandez, R. P., Ordonez, C., Kinnison, D. E., Martin, J. C. G., Lamarque, J. F., and Tilmes, S.: Iodine chemistry in the troposphere and its effect on ozone, *Atmos Chem Phys*, 14, 13119-13143, 10.5194/acp-14-13119-2014, 2014.

Sekiya, T., Kanaya, Y., Sudo, K., Taketani, F., Iwamoto, Y., Aita, M. N., Yamamoto, A., and Kawamoto, K.: Global Bromine- and Iodine-Mediated Tropospheric Ozone Loss Estimated Using the CHASER Chemical Transport Model, *Sola*, 16, 220-227, 10.2151/sola.2020-037, 2020.

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