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Interactive Comment

Interactive comment on "Iodine oxide in the global marine boundary layer" *by* C. Prados-Roman et al.

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The manuscript "Iodine oxide in the global marine boundary layer" by Prados-Roman et al. presents multi-axis DOAS measurements of IO radical mixing ratios (< 1 pptv, altitude $\leq$ 600 m) performed over the marine boundary layer (MBL). A combined analysis with other field data suggests that iodine driven chemistry is of global importance over the oceans. A 3D CAM-Chem model discerning the contribution of organic and inorganic emissions (specifically hypoiodous acid and molecular iodine), and their associated geographical dependence, estimates that 75% of the total iodine oxide budget if of abiotic origin in the global MBL. This manuscript is an important contribution to understand the oxidizing capacity of the atmosphere and presents new data to support an abiotic mechanism is operative over open ocean waters. However, it would be important to consider in this manuscript a recent laboratory study by Pillar et al. (En-

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Interactive Discussion

Discussion Paper

viron. Sci. Technol., 2013, 47, 10971−10979, http://dx.doi.org/10.1021/es401700h) that indicates how sea spray aerosol production and in-situ oxidation produces hypoiodous acid and molecular iodine. Guzman et al. (J. Phys. Chem. A, 2012, 116, 5428–5435, http://dx.doi.org/10.1021/jp3011316) studied the enrichment of halides during aerosolization of seawater mimic samples providing new insights about how concentration effects could be included in a model. More importantly, it would be interesting to discuss in the final version of the manuscript to be published in ACP how reactions at the air−water interface of sea spray, followed by transfer of reactive products to the gas-phase (Environ. Sci. Technol., 2013, 47, 10971−10979, http://dx.doi.org/10.1021/es401700h) contributes to the model presented. In addition, it would be important to connect the manuscript with Pillar et al. previously proposal indicating that 1) the actual source of reactive iodine species will vary geographically., 2) the production of sea spray will be sensitive to local conditions, particularly surface winds, 3) the production of iodine will depend on factors such as temperature, humidity, and the concentration of halogen species, and 4) 3D models should be chosen over 1D models to approach this problem.

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