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Budgets of Nonmethane hydrocarbons and carbon monoxide in the marine boundary layer of the southern Atlantic Ocean (OOMPH campaign, Jan-Mar 2007).

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During the OOMPH campaign on-board the R/V Marion Dufresne in January-March 2007, Nonmethane hydrocarbons and Carbon monoxide (CO) were measured both in the air and in the ocean surface during the tracks from Cape Town to Punta Arenas and Punta Arenas to Reunion Island. High variabilities of NMHC and CO in seawater were encountered during these tracks particularly in a phytoplankton bloom near the Argentinean coast, and at the crossing of subpolar and subtropical oceanic fronts, on the route from the Southern Ocean to South Africa. In parallel with CO, unsaturated light NMHCs (ethene, propene, butenes, and isoprene) have been measured at levels of the order of 10-60 pmol/litre in seawater and at levels of few pptv to hundreds of pptv in the marine boundary layer (MBL). Using on board LIDAR measurements for the determination of the atmospheric marine boundary layer height, as well as OH radicals and ozone in situ measurements; box models in the MBL and transfer models from the ocean surface to the atmosphere have been applied in order to determine the marine contribution to the atmospheric mixing ratios. The marine production determined independently by sea/air exchange models and atmospheric budgets is discussed for these trace gases, on the basis of the uncertainties in the different parameters used.