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Observations of OH and HO₂ radicals in coastal Antarctica

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Abstract. OH and HO₂ radical concentrations have been measured in the boundary layer of coastal Antarctica for a six-week period during the austral summer of 2005. The measurements were performed at the British Antarctic Survey's Halley Research Station (75° 35' S, 26° 19' W), using the technique of on-resonance laser-induced fluorescence to detect OH, with HO₂ measured following chemical conversion through addition of NO. The mean radical levels were 3.9×10^5 molecule cm⁻³ for OH, and 0.76 ppt for HO₂ (ppt denotes parts per trillion, by volume). Typical maximum (local noontime) levels were 7.9×10^5 molecule cm⁻³ and 1.50 ppt for OH and HO₂ respectively. The main sources of HO_x were photolysis of O₃ and HCHO, with potentially important but uncertain contributions from HONO and higher aldehydes. Of the measured OH sinks, reaction with CO and CH₄ dominated, however comparison of the observed OH concentrations with those calculated via the steady state approximation indicated that additional co-reactants were likely to have been present. Elevated levels of NO_x resulting from snowpack photochemistry contributed to HO_x cycling and enhanced levels of OH, however the halogen oxides IO and BrO dominated the CH₃O₂ – HO₂ – OH conversion in this environment, with associated ozone destruction.

[Final Revised Paper](#) (PDF, 1169 KB) [Discussion Paper](#) (ACPD)

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