



## **Volatile organic compounds above the Southern Ocean**

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Mixing ratios of a variety of volatile organic compounds were measured in the atmosphere using proton transfer mass spectrometry (PTRMS) sampling air from the forward mast of the French research vessel Marion Dufresne (maintained by IPEV/TAAF) during two crossings of the Southern Ocean. The first crossing was between Capetown, South Africa and Punta Arenas, Chile (January 18, 2007 to February 5, 2007) with a return crossing between Punta Arenas, Chile and La Reunion island, Franch department (February 28, 2007 to March 23, 2007). A disjunct eddy covariance methodology was used for air collection on the first crossing while air was simply sampled through a long teflon line using a pump for the return journey. During these crossings, the boat encountered a variety of oceanographic frontal regions, regions of low biogenic density, regions of high biogenic density, and regions of both low and high shipping traffic, and went through periods of sampling chemicals from the ships stack. Volatile organic compounds in the air potentially respond to all of these as well as to the origin of the air prior to having reached the boat (continental influenced or not). Aside from such perturbations, air was generally pristine. Methanol mixing ratios ranged largely between 0.25 and 2 ppbv, acetone between 0.05 and 0.30, and DMS between 0.1 and 0.8 ppbv during the first crossing. While small and possible common changes in mixing ratios occur, unambiguous attribution of the various structures to individual oceanic or atmospheric events is challenging. Nevertheless, overall mixing ratios of methanol compare favorably to preliminary global model output. On the return journey, from the 14<sup>th</sup> of March on, methanol mixing ratios remained between 0.5 and 3 ppbv, acetone between 0.25 and 2 ppbv, and DMS between 0.05 and 0.25 ppbv.