



## **5-year analysis of background surface ozone and carbon dioxide variations during summer seasons at Terra Nova Bay (Antarctica)**

Paolo Cristofanelli (1), Paolo Bonasoni (1), Ubaldo Bonafe' (1), Francescopiero Calzolari (1), Rocco Duchi (1), Christian Lanconelli (1), Angelo Lupi (1), Vito Vitale (1), and Tiziano Colombo (2)

(1) CNR, ISAC, BOLOGNA, Italy (P.Cristofanelli@isac.cnr.it), (2) CNMCA - Climate Department, Pratica di Mare, Roma, Italy

Carbon dioxide (CO<sub>2</sub>) and tropospheric ozone (O<sub>3</sub>) play important roles in determining the radiative budget of the atmosphere. While CO<sub>2</sub> is considered the most important anthropogenic greenhouse gas, O<sub>3</sub> is evaluated as the third most powerful greenhouse gas since pre-industrial ages and, by influencing the lifetime of others greenhouse gases, it provides also an indirect impact on climate.

Within the framework of the Italian National Programme of Antarctic Researches (PNRA), continuous measurements of CO<sub>2</sub>, O<sub>3</sub> as well as meteorological parameters have been conducted at the clean-air facility of Icaro Camp at the "Mario Zucchelli" Station (74.7 S, 164.1 E, 41 m a.s.l., hereinafter MZS-IC) during five experimental summer campaigns from November 2001 to February 2006.

At MZS-IC, average O<sub>3</sub> background concentrations ranged from 18.5 +/- 4.6 ppbv (summer 2005 – 2006) to 22.0 +/- 4.3 ppbv (summer 2003 - 2004). For CO<sub>2</sub>, in good agreement with the global trend observed for the period 2001-2006, background concentrations showed an average growth rate of 2.12 ppmv/year ranging from 369.28 +/- 0.18 ppmv during the summer 2001 – 2002 to 377.76 +/- 0.26 ppmv during the summer 2005 – 2006.

On average, over the five summer campaigns, the O<sub>3</sub> behaviour showed a decreasing trend with highest values in November and a minimum in January, while a broad December-January minimum characterised CO<sub>2</sub>, well tracing the typical O<sub>3</sub> and CO<sub>2</sub> high-latitude seasonal cycles in the Southern Hemisphere.