

Climate Altering Trace Gases at the ABC-Pyramid Laboratory, Himalayan-Karakorum Range, Nepal

P. Cristofanelli¹, M. Maione², F. Calzolari¹, A. Marinoni¹, J. Arduini², E. Vuillermoz³, and P. Bonasoni¹

¹Institute of Atmospheric Sciences and Climate (ISAC), National Research Council (CNR), Via Gobetti 101, 40129 Bologna, Italy; +39-051-6399597, Fax: +39-051-6399652, E-mail: cristofanelli@isac.cnr.it

²University of Urbino “Carlo Bo”, Institute of Chemical Sciences, P. Rinascimento 6, 61029, Urbino, Italy

³EV-K²-CNR Committee, Via San Bernardino 145, 24126 Bergamo, Italy

The Himalayan-Karakorum range, for its elevation and geographic location, represents an ideal place for studying long-range pollutant transport systems on a regional scale and for monitoring changes induced by mechanisms that act on a global scale through monsoon circulation. In fact, the area is located in the middle of two of the most densely populated and rapidly developing countries in the world: India and China. Here, the increasing industrial activities and vehicular traffic led to a significant growth of anthropogenic pollutant emissions. With the purpose of investigating natural and human-induced environmental changes at different scales (global, regional and local) in the Himalayan area, continuous measurement of trace gases and aerosols started on February 2006 in the framework of Ev-K²-CNR “SHARE ASIA” and UNEP “ABC” projects. These activities are carried out at the “ABC-Pyramid Observatory”, a remote monitoring station located at 5079 m a.s.l. in the high Khumbu valley (Nepal), at the foot of Mt. Everest. The development of this station allows continuous in-situ measurements of chemical, physical and optical properties of aerosols and surface ozone. Moreover, non-continuous measurements of climate-altering halogenated gases and aerosol chemical properties have been also conducted. Preliminary observations of climate altering gases will be showed and discussed.

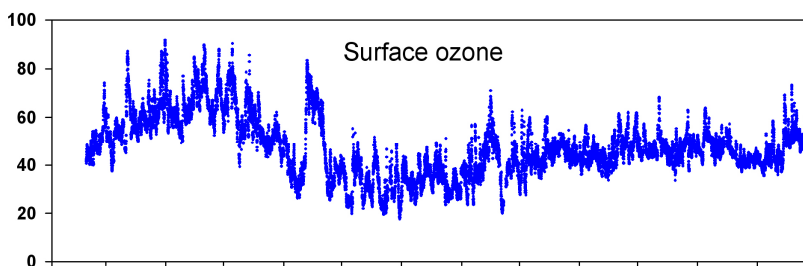


Figure 1. Mixing ratios (expressed in ppbv) of surface ozone recorded at the Himalayan site.

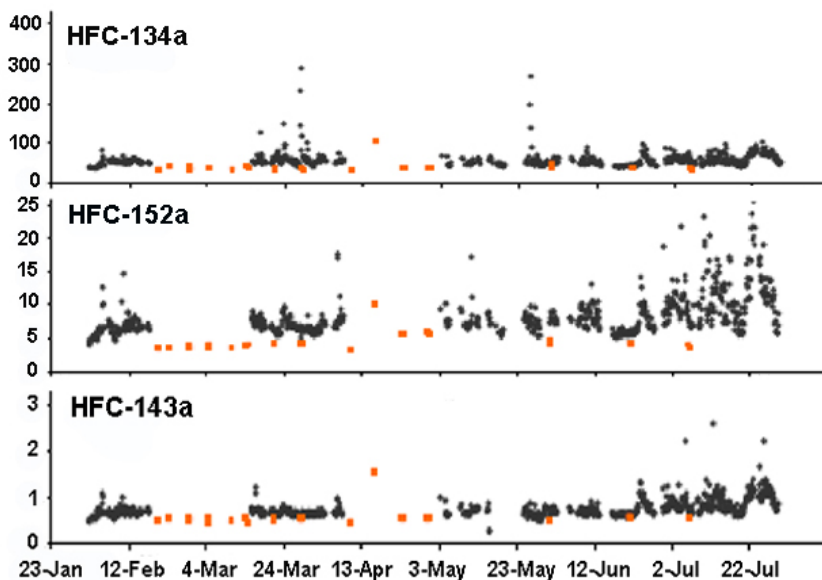


Figure 2. Mixing ratios (expressed in pptv) of selected HFCs (orange dots) recorded at the Himalayan site, compared with those recorded at the European Continental site of Mt. Cimone - Italy (black dots): year 2006.