



Abstract ID : 194

Surface snow and aerosol chemical composition at Dome C from 15-yr long records

Content

Chemical composition of the atmospheric aerosol in the Antarctic plateau provide basic information on the main natural inputs, tropospheric transformation and long-range transport processes of the aerosol components. In addition, chemical and physical processes occurring at the atmosphere-snow interface are yet not fully understood and work is needed to assess the impact of atmospheric chemistry on snow composition and to better interpret ice core records there retrieved.

Thus, simultaneous aerosol and surface snow samplings were set up and run at Dome C station (75° 06' S; 123° 20' E, 3233 m a.s.l) all year-round since 2004/05 and are still ongoing. Aerosol and snow samples were analysed for main and trace ion markers, in order to study the extent and timing of main aerosol sources as sea salt (open ocean/frost flowers/blowing snow), biogenic production, mineral dust inputs, as well as transport processes (free troposphere, stratosphere-troposphere exchange) and atmospheric reaction processes (e.g. neutralization, chemical fractionation).

A comparison with ozone measurements, carried out continuously over the same period, is also attempted, to better constrain the atmospheric processes involving the atmosphere-snow exchanges of N-cycle species and atmosphere oxidative properties.

A summary of the main results achieved in the framework of the PNRA - Programma Nazionale di Ricerca in Antartide) LTCPAA project, started in 2016 and ongoing, is also presented.

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Track Classification: Progress in proxy development