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Prominent features in isotopic, chemical and dust stratigraphies from GV7, a drilling site in East Antarctica

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In the framework of the new project “The IPICS 2k Array: a network of ice core climate and climate forcing records for the last two millennia”, which represents a thematic research line of International Partnerships in Ice Core Sciences (IPICS), a 250 m deep ice core was retrieved (spanning roughly the last millennium) at GV7 site, together with several shallow firn cores and snow pits. The PNRA (Programma Nazionale di Ricerche in Antartide) project “IPICS-2kyr-It” represents the Italian contribution to IPICS “The 2k Array” and it is being accomplished in collaboration with KOPRI (Korean Polar Research Institute).

The availability of various records from the same site all spanning a temporal period ranging from the last decades to the last centuries will allow achieving a stacked record of chemical and isotopic markers and accumulation rate that is basic for a reliable climatic reconstruction.

Previous surveys in the area of GV7 (70°41' S - 158°51' E, 1950 m a.s.l., East Antarctica) showed that this site is characterized by a relatively high snow accumulation (about 240 mm water eq./year), allowing a high resolution study of the climatic variability in the last millennium.

Here we present the isotopic, chemical and dust stratigraphies of the snow pits sampled at GV7 during the 2013/14 field season and analysed in Italy and in Korea.

Reversibly deposited components such as nitrate and methansulphonic acid (MSA) appear to be well preserved and show a clear seasonal profiles, as one can observe from the records achieved both by Italian and Korean labs. Such a feature, together with the high accumulation rate, allowed obtaining an accurate dating of the snow pits, based on the counting of annual layers. At this purpose, a multi-parametric approach was chosen by using MSA, non-sea-salt sulphate, and d18O as seasonal markers. The dating confirmed the value of the accumulation rate found during previous samplings.