



Comparison of in-situ and ex-situ metamorphism in near-surface snow stratifications at Dome C

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An important step towards a better understanding of the formation of climate signals in near-surface polar snow/firn is the interplay of post-depositional processes with a given stratification reflecting the characteristics of the accumulation. As one of the key processes, snow metamorphism is controlled by the seasonal variation of near-surface temperatures/gradients. For low accumulation sites this causes a coarse sublimation-deposition pattern superimposed on a fine-layered stratification. To understand these processes and potential consequences for the formation of climate signals we developed a portable rack of four macroscopic metamorphism boxes in which large (0.4m x 0.4m x 0.3m), stratigraphically heterogeneous snow blocks can be subjected to different temperature forcings under sealed conditions after excavation from the natural snowpack. The rack was deployed at Dome C during the two months in the Antarctic Summer 2017/2018 to detail the role of metamorphism within the IPEV project "Snow properties evolution in a changing climate in Antarctica". In the campaign we conducted ex-situ sensitivity experiments for the evolution of signals (microstructure, isotopes) and compared it to the concurrent in-situ dynamics that was monitored by field measurements. In this presentation we report on first results of the evolution of stratigraphy from the sensitivity experiments under four temperature/gradient scenarios that have been analyzed by micro-computed tomography.