



### Short Visit Grant

### Scientific Report

***Proposal Title:*** *Texture measurements in snow samples from Antarctica*

***Application Reference N°:*** 7288

#### ***1) Purpose of the visit:***

This visit took place in the frame of a on-going collaboration between Martin Schneebeli, SLF-Davos, and I on the measurement of texture in snow samples. This collaboration is now supported by a post-doctoral colleague, Neige Calonne, who is working on performing the thin sections of snow and the analyses with the Automatic Ice Texture Analyser (AITA) from Grenoble, and developing a new texture analyser in Davos.

The purpose of this visit was therefore to discuss and analyse the textures measured on snow extracted from snow pits in Antarctica (Point Barnola). This measurements were initiated during my visit in Davos, in August 2013, and Neige completed them recently. Another purpose was to perform some comparison between the results obtained with the Grenoble AITA, developed by D. Russell-Head, Australia, and the Davos “home made” analyser, based on the technique developed by R. Heilbronner, Norway. Unfortunately, the Davos analyser was not completely set, and comparison could not be made.

#### ***2) Description of the work carried out during the visit***

- Analyses of the texture data obtained along 3 profiles from snow samples of Point Barnola, Antarctica (3 m depth pits). Deep analyses of the statistical relation between texture type (girdle, single-max, isotropy, measured by the 2d order orientation tensors), strength (measured by Isotropy factor, Elongation factor...), and density estimated from tomography measurements performed on each sample in Davos.
- Discussion about the physical mechanisms that could be responsible for the relationship between texture type and strength, and density.
- Elaboration of a first plan for a scientific article to be published with these results.
- Discussion about the frame of the on-going collaboration

### ***3) Future collaboration with host institution***

The collaboration is going on, and is favoured by the post-doctoral position of Neige Calonne on the exact subject of the collaboration. Future visits were planned, concerning comparisons between texture analysers, analyses of the results, and experiments to carry on.

### ***4) Projected publications / articles resulting or to result from the grant***

One publication is planned on the statistical analyses of the texture measurements performed on snow samples extracted from Point Barnola. Data are available, and mostly treated. A presentation of the results will be given by Neige Calonne at the PIRE workshop in Grenoble, Septembre 2015.