

Fellowship (PE11525)

“Dynamics of magma intrusion and eruption: Insights from the Hotaka-Takidani complex, northern Japan Alps”

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Host Researcher: Prof. Simon Wallis (University of Nagoya, Japan)

The JSPS short-term fellowship I have been awarded to perform research in collaboration with Professor Simon Wallis of the University of Nagoya lasted from the middle of July to the middle of October 2011.

The period I spent in Japan has been memorable for many reasons: I visit for the first time Japan and I had the luck of sharing time and experiences with Japanese colleagues and learn something of a culture that is significantly different from the European one. In terms of the research we performed in collaboration with Prof. Wallis and his group, I am equally enthusiastic because we develop new techniques to investigate the modalities of magma emplacement in the Earth's crust, which are fundamental for our understanding of how volcanoes work. A great part of this success resides on the interdisciplinary collaboration between the group of Prof. Wallis, specialised in structural geology, and myself principally working on physical properties of magmas and petrology.

Research

During the fellowship we performed fieldwork on the Takidani pluton (Northern Japanese Alps; Fig. 1). This magmatic intrusion, today exposed on the surface, represents a paleo magma chamber that fed a very large eruption (700 km³ of erupted magma) about 1.5 million years ago. Being the youngest magmatic body today exposed at the surface, the study of this intrusion offers a unique snapshot of a magmatic system present below active volcanoes.

We studied fabrics and textures of rocks collected in the field, using Electron Back-Scattered Diffraction (Fig. 2; in collaboration with Prof. Katsuyoshi Michibayashi of Shizuoka University). This study allowed retrieving information on the physical properties of magma when these rocks were still molten magma, which will allow us establishing relationships between magma properties and the possibility of a volcanic eruption to occur.



Figure 2: Left hand side: Photo of the field area. Right hand side: Me in the field.

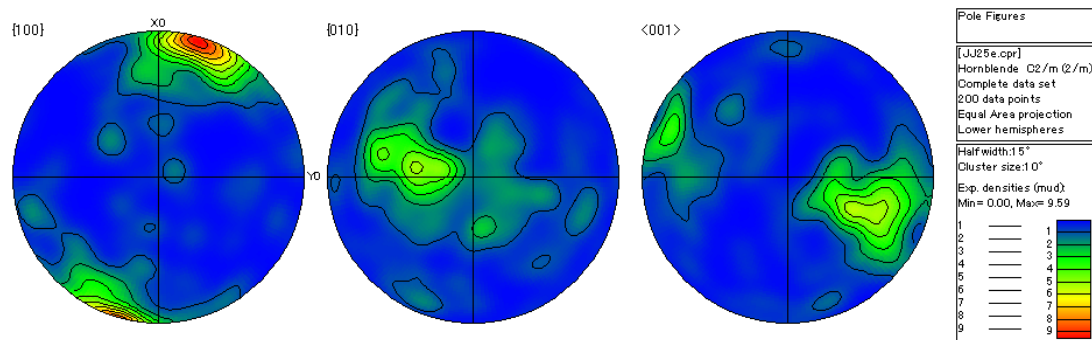


Figure 1: Lower hemisphere projections of the orientation of amphibole elongation axes in rocks from the Takidani complex. The analyses have been performed at Shizuoka University. The intensity of the fabric (higher for hotter colours and closer spacing of the contours) is directly proportional to the strain suffered by the rock when it was in the partially molten state during flow.

International exchange achieved through the research

The experience in Japan has been highly rewarding for me both in terms of personal and scientific experience and this created the perfect conditions to establish collaborations between the research group lead by Prof. Simon Wallis and me. I am already applying for additional support from research councils to keep collaborating with the group at Nagoya University. I strongly recommend researchers in Europe to apply for a JSPS fellowship and share research and life experiences with our Japanese colleagues. The opportunity of living in Japan for 3 months, offered by the JSPS fellowship I was awarded, was extremely formative and very enjoyable both personally and scientifically.