



## **Lazufre volcanic complex, Chile: attempts to image a large scale magmatic inflation body using regional and teleseismic broadband recordings**

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The Lazufre volcanic area around Lastarria and Cordon del Azufre in the central Andes is the second largest area of presently active volcano related uplift worldwide. A magma reservoir or sill layer, filling in about 10 km depth, is thought to be causative for inflation of an area of more than 1800 km<sup>2</sup> (more than four times larger than the total area of the city of Vienna). Uplift rates of up to 3.2 cm/yr were found from InSAR measurements during the past two decades.

In 2008, we deployed a network of 17 broadband seismometers in and around the area of active uplift for a period of 2 months. Hundreds of regional and several teleseismic earthquakes were recorded during the experiment. Recorded seismograms show strong anomalies in the region of maximum uplift. We tried to apply (1) tomography with regional events and (2) the receiver function technique with teleseismic events in order to interpret the recorded anomalies. Due to the relatively short dataset and the very heterogeneous structure beneath Lazufre, both techniques could only be applied with limited success.

(1) To gain a full tomographic image of the deep underground, ray coverage was not dense enough. However, recorded delay times and amplitude decreases for rays passing through the inflation center carry valuable information.

(2) Receiver functions were strongly influenced by 3D structure and could not be interpreted using standard techniques. Nevertheless, careful data selection and comparison with modelling results led to conclusions.

In combination, our results allow for some insights into the volcanic complex. We can confirm the presence of molten or partially molten material at a depth of 8 km in the center and 12 km in the outer parts and can derive constraints on the lateral extent of the intrusion. We also find evidence for a huge low velocity zone at greater depth.