



## Seaward dipping reflectors across the northeast Faroes volcanic margin

Z. C. Lunnon (1,2), R. S. White (1), P. A. F. Christie (2), C. J. Parkin (1), A. W. Roberts (1) and the iSIMM team\*.

(1) Department of Earth Sciences, University of Cambridge, U.K., (2) Schlumberger Cambridge Research, U.K., (lunnon@esc.cam.ac.uk)

Seaward dipping reflector (SDR) sequences occur at all volcanic margins. For example, in the Northern Atlantic, SDR sequences have been observed above the Vøring, and Lofoten margins off Norway, Edoras Bank and Hatton Bank off NW Europe, and offshore Greenland. In the south Atlantic, SDR sequences are seen offshore Namibia, Brazil and Argentina. They have also been found off the southeastern USA, off the east coast of Antarctica, and in the Gulf of Aden.

Planke, S., Symonds, P.A., Alvestad, E and Skogseid, J, (*J Geophys Res*, **105**, 19335-19351, 2000) note that SDR sequences can be divided into two types according to their environment at the time of emplacement: submarine and subaerial. Both are observed at most volcanic margins, and, from the data collected for the iSIMM project, we document both types of SDR sequence across the margin northeast of the Faroe Islands. The submarine-emplaced SDR sequence extends some 90 km north of the continent-ocean transition, i.e. much further than the 20 or so km seen on the Vøring margin, or even the 45 km seen on the conjugate margin east of Greenland. It is a comparable extent to that seen offshore Namibia, where a submarine-emplaced SDR sequence above thickened oceanic crust has been observed which extends 80 km beyond the continent-ocean transition. The submarine SDR sequence we observe also lies above thickened oceanic crust (10 – 13 km). We attribute the thickening of the crust to the proximity of the Iceland mantle plume as the submarine SDR sequence was formed. The submarine SDR sequence is typically 2 – 2.5 km thick, and individual reflectors can be traced for up to 10 km down-dip.

In contrast, the subaerial SDR sequence is 4.5 km thick, and single reflectors can

be traced for more than 20 km. The flows seen here are clearly imaged; they have a convex upward arcuate shape, and thicken down-dip, as is also seen on the Vøring Margin. Pálmason, G., (*J Geophys*, **47**, 7-18, 1980) proposed a kinematic model for the formation of crust in Iceland which lies above a plume-affected mid-ocean ridge. We have picked the subaerial SDR reflectors, and fitted them to this model. The fit is good, and suggests that the entire subaerial SDR package seen here was extruded in less than two million years.

\*The iSIMM team consists of: Roman Spitzer, Craig Parkin, Lindsey Smith, Nick Kuszniir, Vijay Tymms, Neil Hurst and Alan M Roberts.