

## The Daskop Granophyre Dyke: Inhomogeneous clast distribution and chemistry

Elizaveta Kovaleva (1), Matthew S. Huber (1), Andrew Somers (2), and Stuart Bateman (3)

(1) University of The Free State, Faculty of Agricultural and Natural Sciences, Department of Geology, Bloemfontein, South Africa (kovalevae@ufs.ac.za), (2) SciAps, Inc. , (3) Innov-X Africa

The Vredefort Granophyre is present in the central basement of the Vredefort impact structure as a set of dykes up to 9 km long and up to 65 m wide and is considered to be the remnant of the impact melt sheet (e.g. French et al. 1989; French and Nielsen 1990). The dykes intruded into the floor of the structure's core during the crater modification and settling stages (e.g. Therriault et al. 1996). Granophyre is typically considered a well-homogenized and uniform melt (e.g., Nel 1927; Gibson and Reimold 2008). This study presents new insights into the chemical variety and inhomogeneous clast distribution of the Vredefort granophyre.

The Granophyre dyke on the farm Daskop is located in the core of the impact structure and hosted by granitic gneiss of the Archean basement. The clast distribution was mapped in the eastern half of the dyke. Additionally, non-destructive geochemical methods (handheld  $\mu$ XRF and LIBS systems) were used to obtain chemical analysis of the dyke along strike.

The map of clast distribution in the granophyre dyke reveals an inhomogeneous content of clasts, with a consistently higher concentration of clasts along the southern contact. This distribution suggests that either 1) the dyke orientation is non-vertical, allowing gravitational settling to affect the distribution of the clasts after the dyke intruded; or 2) that clasts were preferentially entrained along the southern margin of the dyke. Clast frequency also differs along strike. Many elongated clasts are oriented parallel to the dyke walls, indicating flow. We have also documented linear structures resembling flow channels. These structures are strictly parallel to the dyke walls and have a finer texture than the host granophyre. These may represent differentiation of the melt during crystallization.

Chemical inhomogeneity of granophyre dyke has also been documented along strike. Such chemical variation may reflect local differences in the relative amounts of target rocks incorporated into the melt (e.g. French and Nielsen 1990).

### References

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