



Microseismic Observations in the Karoo: Leeu-Gamka, South Africa

Melody Fynn (1), Beth Kahle (), Richard Kahle (), and Chris Hartnady ()

(1) Department of Geological Sciences, University of Cape Town, South Africa (fynmel001@myuct.ac.za), (2) Department of Geological Sciences, University of Cape Town, South Africa (beth.kahle.uct.ac.za), (3) Department of Geological Sciences, University of Cape Town, South Africa (richard.kahle@uct.ac.za), (4) Umvoto Africa, Muizenberg, South Africa (chris@umvoto.com)

We report on a micro-earthquake study in the interior of South Africa, in a tectonically stable intraplate setting centered on the town of Leeu Gamka, Western Cape province. The International Seismological Centre (ISC) catalogue reports localised anomalous seismicity in the region between 2007 and 2012 with local magnitudes up to 4.5. The apparent duration and time history of this anomalous seismicity is likely, in part at least, a reporting artefact.

We deployed an array of 23 geophones for three months (March–June) in 2015, covering an area of 60×65 km centred on the zone of anomalous seismicity. The array recorded a total of 113 earthquakes over this period, with almost all events clustering in a surprisingly small area (78% of the epicentres fall within a one square kilometre block). Double difference relocation resolves the hypocentres onto a structure with an apparent NW-SE orientation, consistent with large-scale fabric that can be recognised in satellite imagery. Although the hypocentre depths are not very well constrained, their apparent range of 5–7 km puts them at the base of the Karoo basin.