



Microseismic observations in the Cape Fold Belt, Western Cape, South Africa

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We present data gathered from a microseismic experiment conducted in the Western Cape, South Africa. The study area lies within a stable intraplate region and was host to the largest instrumentally recorded earthquake (ML 6.3) in South African history in 1969. We deployed an array of fifteen 4.5 Hz triaxial geophones sampling continuously at 200 Hz for a three month period covering an area of roughly 30 x 40 km including the 1969 aftershock zone. A total of 351 events were identified on three or more stations and after manual P- and S-wave picking, a subset of 168 were used for further investigation. Coupled hypocenter and velocity inversion was performed with 59 well located events using VELEST and all events were relocated after a final velocity model was obtained. Seismicity occurs from the surface down to roughly 15 km on a sub-vertical NW-SE striking structure. The maximum depth of events increase toward the NW. The distribution of seismic events correlates well with the aftershocks measured in 1969 and 1970. Local magnitudes were calculated for the dataset and range from $-2.2 < \text{ML} < 1.6$. A Gutenberg-Richter b-value of 0.9 was obtained for the dataset.