

## 25 Hz 24 bit continuous monitoring of strain on M3 seismogenic fault at Mponeng mine, South Africa with Ishii's strain meter

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In South African deep gold mines (2-3 km deep), tabular gold reef more or less 1 m thick is mined, inducing seismic events (M smaller than 5). Larger events tend to occur in the proximity of existing weak zones, e.g. faults or dyke. So, if we a priori install instruments around the zones in the proximity of the gold reef that is going to be mined, we can monitor a whole life of an earthquake (Iio 1995). So far, in co-operation with ISS International Ltd. the Research Group for Semi-controlled Earthquake Generation Experiments in South African Deep Gold Mines (e.g. Sumitomo 1998) have installed tri-axial borehole accelerometers and Ishii's multi-component borehole strain meters, data being recorded with the recording system (ISS International Ltd.) with wide-band wide-dynamic range.

In 1999, Ishii's borehole strain meter was installed on the seismogenic fault in Harmony mine (formerly Bambanani mine), Welkom where an M~3 event is expected. In the other oral presentation in this meeting, some examples of events with M smaller than 2 and distances within 200 m are introduced.

However, in South African gold mines we often have underground fire, our monitorings often being suspended. As remnant of reef is getting decreased, mines are sometimes sold, the monitorings also being suspended. To decrease possibility of further intermission of monitoring, we have to look for another field in other mine.

The field thus we newly found was near a dyke in Mponeng mine ~2800 m deep. We drilled a hole nearly in parallel to the strike of the dyke and installed a 4-component Ishii's strain meter. The strain data are acquired with 24 bit 25 Hz recording system (MS, ISS International Ltd.). In conjunction with seismic data supplied by Mponeng mine network, we analyze a whole process of an earthquake, as we do at Harmony mine, Welkom. In the poster, geological setting, mining, background seismicity, and the details about our strain monitoring are introduced.

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