The second report on the Semi-controlled Earthquake-generation Experiment at the 104/44 Mponeng gold mine, South Africa.

Ken Morishita[1]; Hiroshi Ogasawara[2]; Yoshihisa Iio[3]; Masao Nakatani[4]; Jun'ichi Takeuchi[5]; Naoyuki Shimoda[2]; Aitaro Kato[6]; Hiroshi Ishii[7]; tsuneo yamauchi[8]; Rob McGill[9]; Gerrie van Aswegen[10]; Aleksander Mendecki[10]; Tony Ward[11]; Patric Lenegan[12]; Fracois du Plessis[12]; Sumitomo Norihiko International Research Group for Semi-controlled Earthquake Generation Experiment at South African Gold Mine[13]

[1] Physical Science, Ritsumeikan Univ; [2] RitsumeiUniv.; [3] DPRI; [4] ERI; [5] RitsumeiUniv.

; [6] ERI, Univ. Tokyo; [7] TRIES; [8] RCSVDM; [9] Mponeng mine; [10] ISSI; [11] Seismogen; [12] ISS International; [13] -

I Is there any essential difference in physics between lab-scale fracture experiments and huge natural earthquakes? In order to address the problem we need a meso-scale experiment or an observation of smaller earthquakes at the closest proximity of the hypocenters. So, we, the International Research Group for the Semi-controlled Earthquake-generation Experiments in South African deep gold mines (SeeSA) have been attempting monitoring examples of Mover2 within 100 m with the highest dynamic range and resolution. Since 1994 we have deployed a pilot and five experimental sites, installing the Ishii strainmeters, accelerometers and strong ground motion meters in addition to existing mine's geophone networks (a typical station spacing of ~500m; 2 kHz sampling). At the second experimental site (the Bambanani mine), a 24-bit 25-Hz strain change (over 1E-4) successfully, completely recorded associated with two Mover2 events in 2003 within ~100 m from the Ishii strainmeter. However, available was only a single strainmeter and no closest accelerometer because of the seismic fall-of-ground, letting us struggle to locate hypocenters with sufficient accuracies (e.g. Takeuchi et al. 2003, 2004; Shimoda et al. 2004).So, more redundant array was successfully deployed in 2003 at the Pretorius fault zone at a 2.9-km depth at the Mponeng mine, consisting of the multiple Ishii strainmeters, temperature sensors, fault displacement meters and strong-ground-motion meters. The experimental site is surrounded by a mine's existing geophone network (~500m station spacing) as our previous experimental sites were, but has the additional characteristics that we never had in previous experiments:

- being located adjacent to a denser, temporal geophone network (~200 m station spacing),
- A potential seismic source (a significantly weak plane) is located with a 10-cm accuracy by an image logging in 9 holes (15-30 m long) and on the tunnel wall across the plane.

We are expecting an event enabling us to discuss the entire life span of an earthquake in further detail.

Following the first report at the 2004 Fall Japanese Seismological, the poster begins with the additional detail of seismicity, followed by reporting as to the earthquake-associated changes and the long-term strain build-up, specifically on the comparison of the recordings with multiple strain meters.