

Relationship between b-value and stress parameter;Semi-controlled experiment in a gold mine in South Africa (21)

Satoshi Nishii[1], Hiroshi Ogasawara[2], Kazuo Mino[3], International Research Group for Semi-controlled Earthquake Generation Experiment at South African Gold Mine Sumitomo Norihiko

[1] Fac. Sci. & Engr., Ritsumeikan Univ., [2] Fac.Sci. Engr., Ritsumeikan Univ., [3] Fac. Sci. Engr., Ritsumeikan Univ.

We investigated the relationship between b-value and stress by analyzing induced earthquake at 2650m depth in a South African gold mine. High stress (10^6 [Pa]) and low b-value (0.75) was estimated in the small rectangle remnant of reef, while low stress (10^4 [Pa]) and high b-value (1.42) was estimated near the long mining face. In low b-area clear sequence of forshocks, mainshock (M2.0) and aftershocks were observed; high stress drop (10^6 [Pa]) with low b-value (0.8) before mainshock was observed, while low stress drop(10^5 [Pa]) with high b-value(1.3) after mainshock. Consequently, we confirmed negative correlation between b-value and stress in much larger scale than laboratory rock fracture.