

Multi-fixed observations of self-potential in sub-layer at active sites and variations of the potential distribution with time

Koichi Nakagawa[1]; Takashi Okamoto[2]; Tsuyoshi Haraguchi[3]; Hiroo Nemoto[4]; Isamu Tsuka[4]; Mayumi Yoshioka[1]; Chiharu Okuda[5]

[1] Geosci., Osaka City Univ.; [2] FFPRI; [3] Geosci., Osaka City Univ.; [4] Geosciences, Osaka City Univ.; [5] Geosciences Sci., Osaka City Univ

Some electrical polarizations were observed in common saturated fine aggregates, such as fault gouge, during the shear deformation test in laboratory (Nakagawa et al., 2004). This phenomenon is called SIP (Shear-induced Polarization). SIP can be interpreted in terms of physicochemical interaction between fine particle and interstitial water through the electric double layer. However, the SIP was not detected in the remolded clay for handicraft-use which may be treated with some non-dipole oil.

We applied the phenomenon obtained from the laboratory to the field for investigation on the electro physics during the fault sliding process. Three dynamically active sites were selected for the measurements of self potential. Those sites are; the Atotsugawa active fault at Kamioka mine, Central Japan, the Busuno landslide block in Niigata Prefecture, Northeast Japan and the Nuta-Yohne landslide block in Kohchi Prefecture, Southwest Japan. Several tens carbon electrodes of 40cm in length and 13mm in diameter were buried at depth of 2 or 3m at each site. In many cases, the precipitations gave rapid changes of self potential. General features of the self potential variation with time recorded were similar to that of land slide displacement.