

Deep underground stress state in Japan from hydraulic fracturing data

Akio Cho[1]

[1] GSJ, AIST

I discuss the deep underground stress state from stress data, which were measured at 23 sites in Japan by the hydraulic fracturing method. The magnitude of the horizontal stress depends on density of host rock. In sedimentary soft rocks, which density is less than 2500kg/m³, the magnitudes of S_{hmin} and S_{Hmax} increase linearly with depth. In hard rocks, which density is greater than 2500kg/m³, stress magnitude is almost constant at intermediate depth (from about 250m to 600-800m). S_{hmin} and S_{Hmax} are within the range of 10-20MPa and 20-32MPa, respectively. Below 600-800m, S_{hmin} and S_{Hmax} increase to more than 30MPa and 50MPa, respectively. There is a stress de-coupling zone at the depth of 600-800m in hard rocks, where frictional strength of host rock is equal to S_{Hmax} .