

## Formation of single-fracture plane at desired directions by controlled fracturing of borehole for monitoring of tectonic stress

# Yoshinori Iwasaki[1], Shosei Serata[2]

[1] G.R.I., [2] SGI

Hydraulic or sleeve fracturing method measures the minimum stress vector by creating a fracture plane normal to the vector. Reopening of the fractured plane enables us to monitor changes on the vector. To measure change of the stress tensor, however, stresses at least three fractured planes with three different directions respectively, have to be measured, simultaneously. The controlled-fracture method, which uses a pair of semicircle friction shells, can produce a multiple of single-fracture planes at any desired directions. The friction loading induces highly concentrated tension stress along the split of the shells, resulting in the single-fracturing. This method can provide fracture planes with different directions in a borehole as the basic means to monitor tectonic stress tensor.

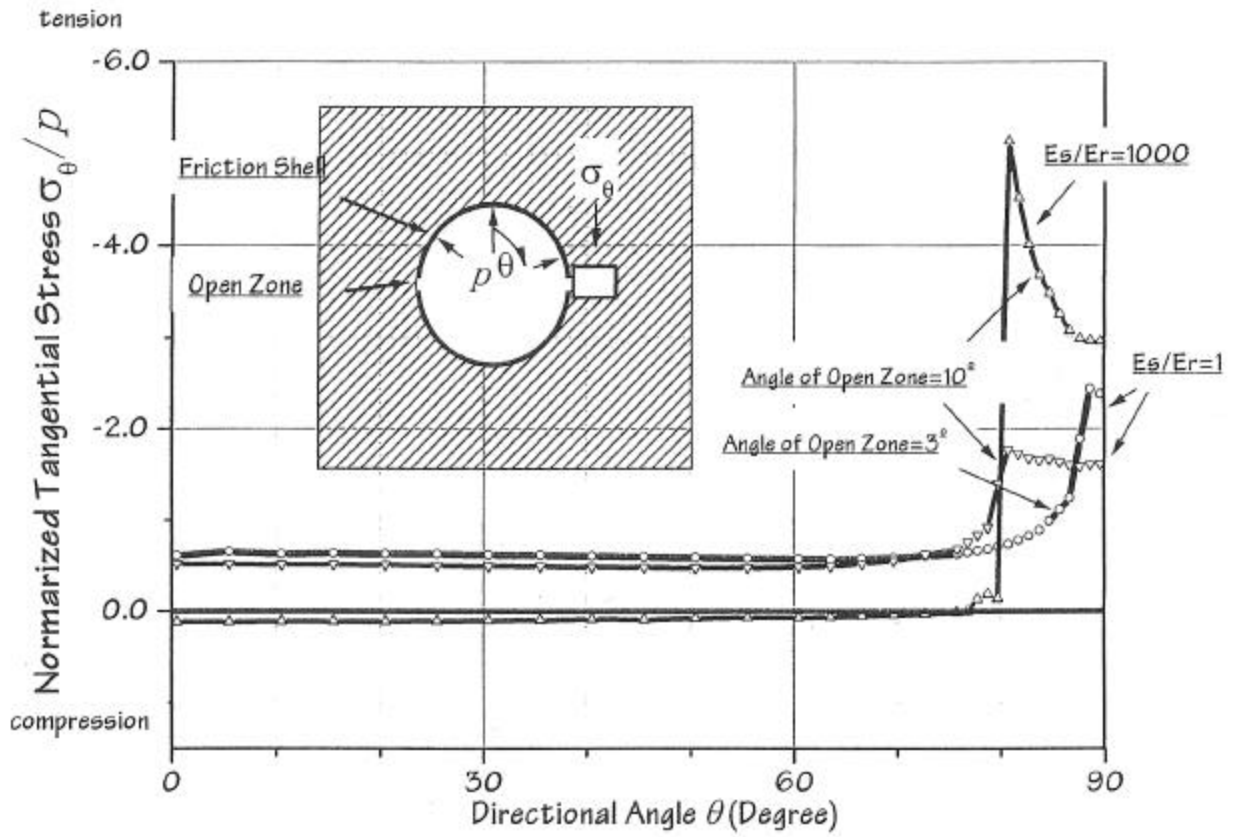
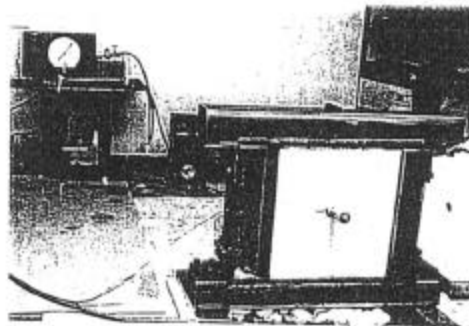
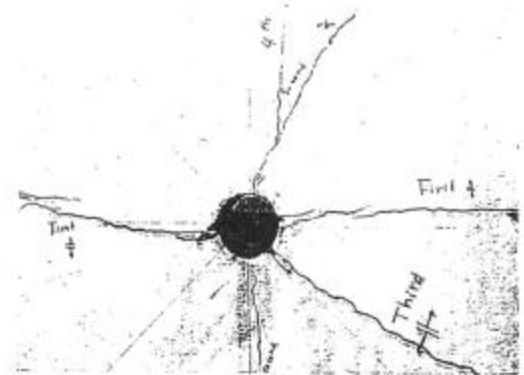
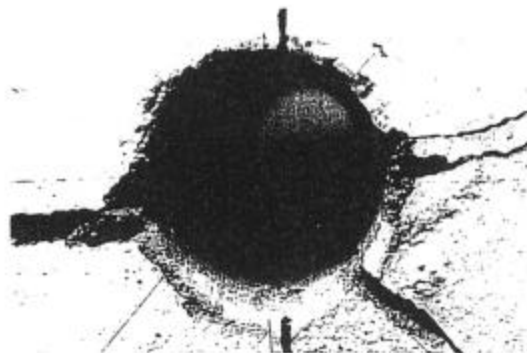
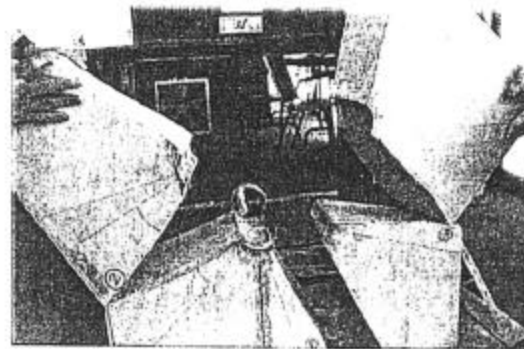


Fig.1 Induced Tangential Stress around Borehole



Biaxial Loading Stand

Cement mortar specimen (60x60x20(cm))



Three single fractured planes created

Fig.2 Laboratory Experiment of Controlled Friction Shell Fracture