Grain size evolution and mechanical behaviors of rocks during dynamic recrystallization: Theory and numerical simulation

Ichiko Shimizu[1]

[1] Geological Inst., Univ. Tokyo

The mechanical behavior and the grain size distribution during high-temperature dislocation creep accompanied with dynamic recrystallization was numerically investigated by a simple `box model'. Each `box' contains grains of the same grain-size class of either `growing' or `shrinking' mode. Strain hardening by accumulation of dislocations, and softening by nucleation and grain boundary migration were simulated, and volume fractions and stored energies of each `boxes' are traced. According to the cycles of deformation-nucleation-growth, flow stress is oscillated.