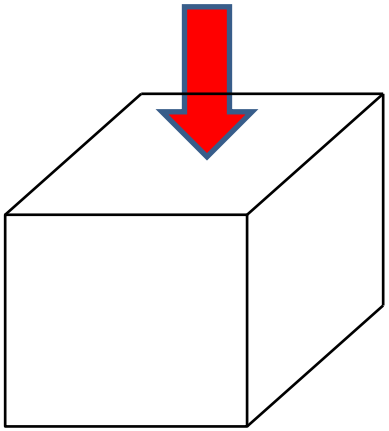
Visco-Plastic Self-Consistent (VPSC) Deformation Simulation on FCC Polycrystalline Aluminum

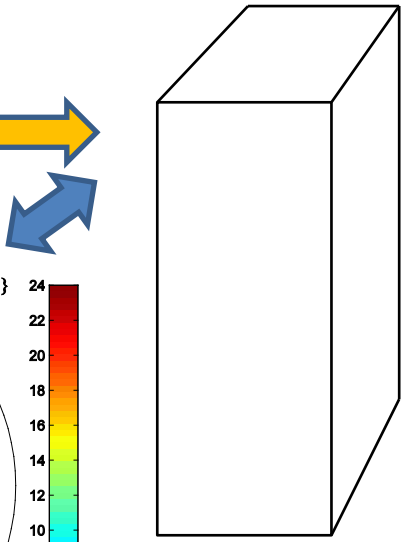
Q. Ma, A.L. Oppedal, M.F. Horstemeyer

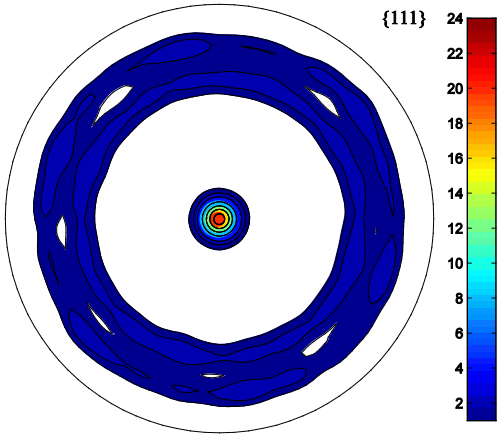
Jan-27-2011

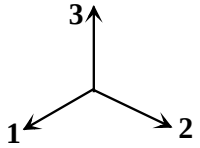
deformation

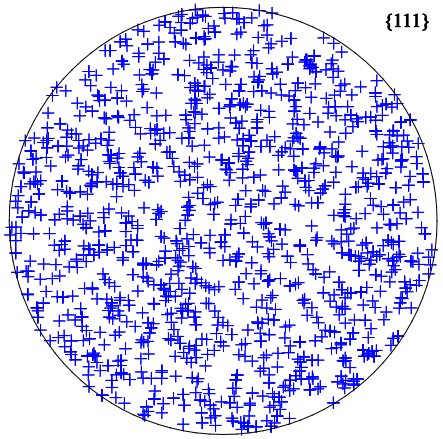
Tension state at strain $\varepsilon_{33}=2.0$

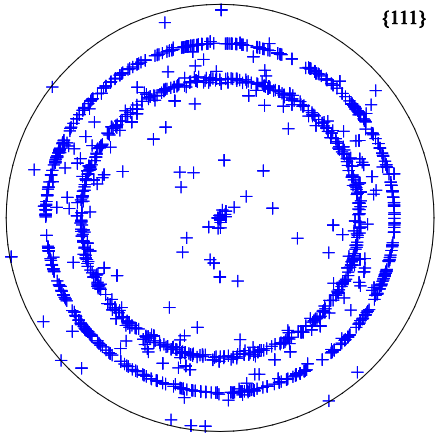


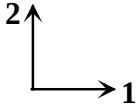


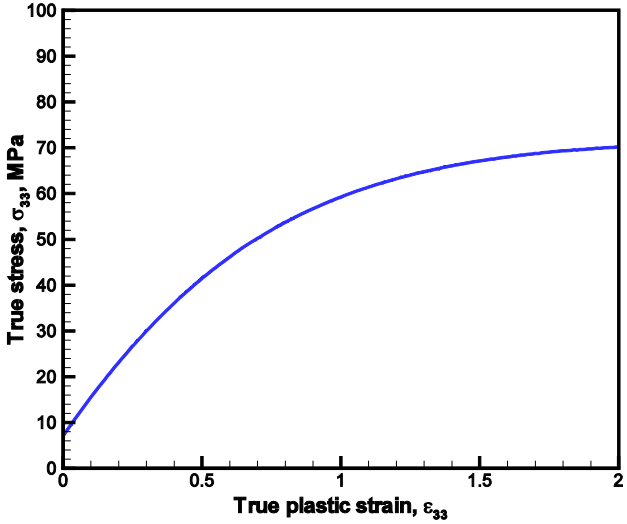










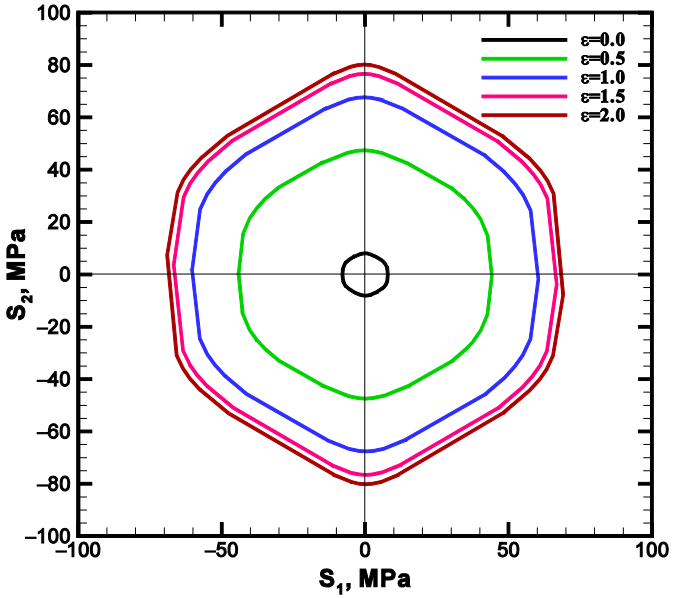


initial distribution

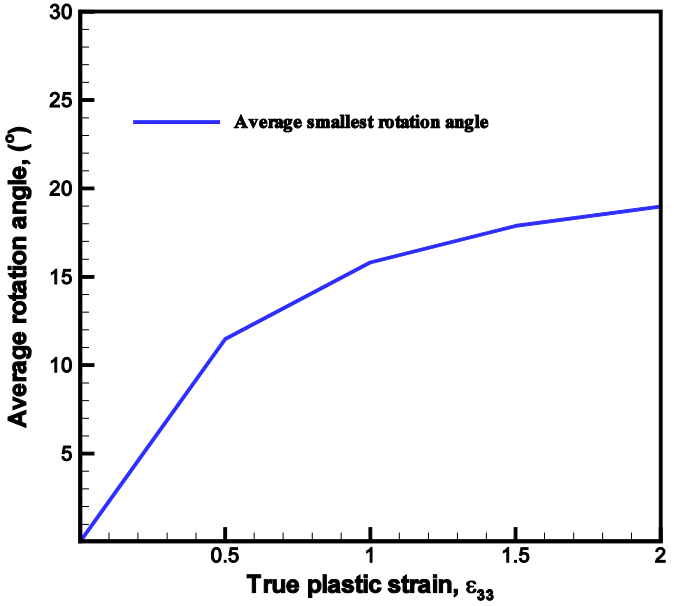
texture at strain $\varepsilon_{33}=2.0$

stress-strain behavior

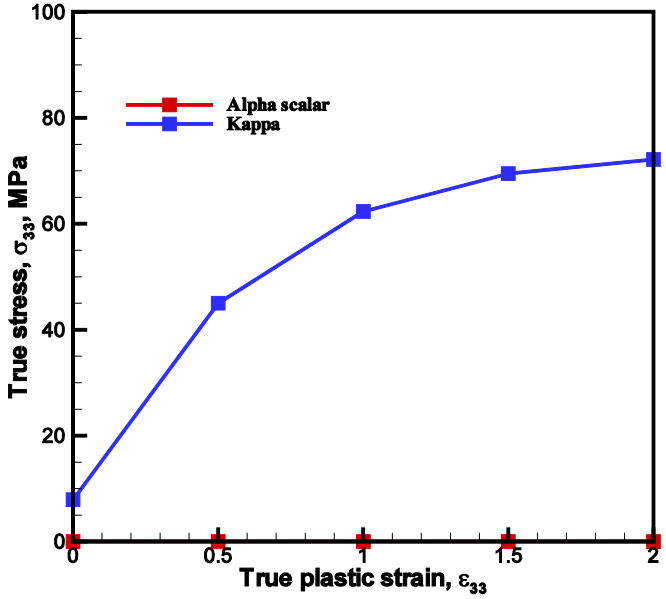
yield surface, average rotation angle, alpha and kappa hardening predictions



Yield surface at various strain levels



Average rotation angle (°)

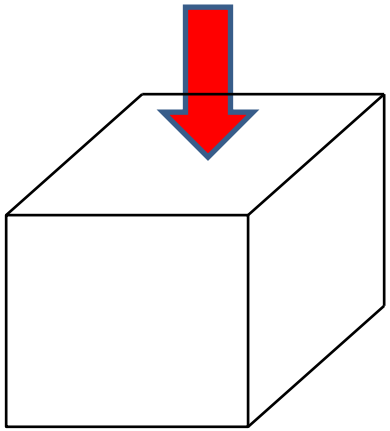


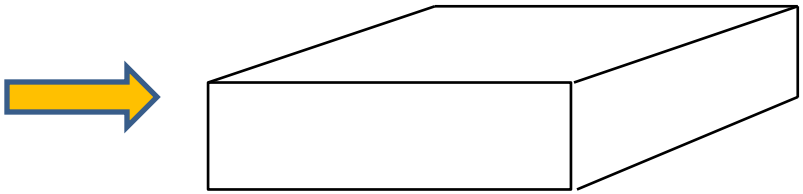
Alpha and Kappa hardening curves

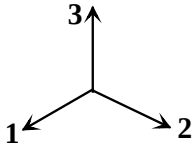
Uniaxial tension

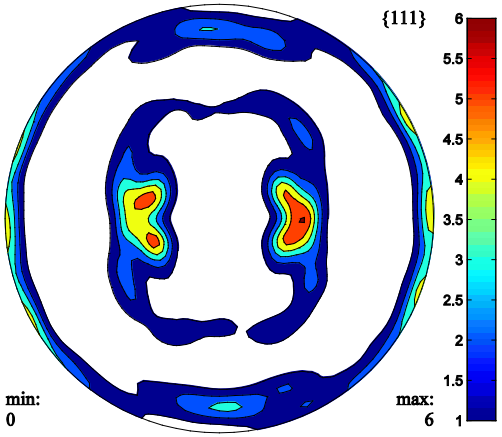
deformation

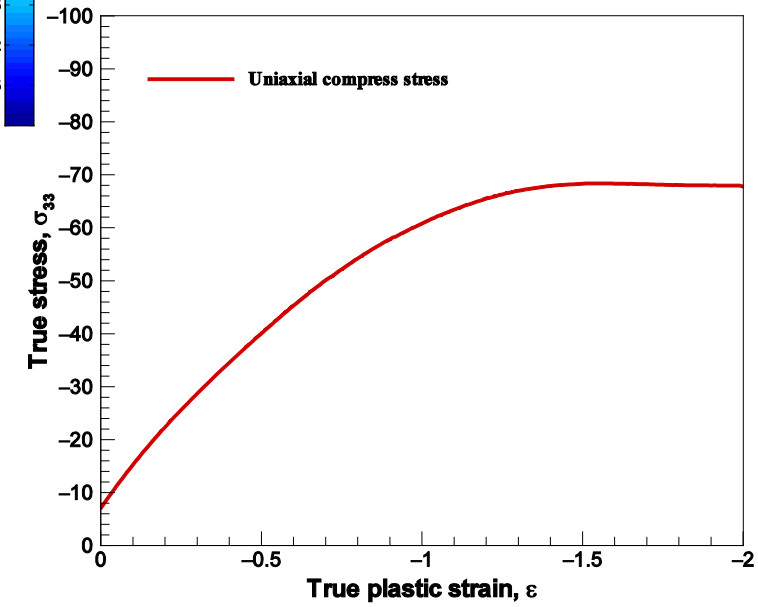
compressed state at strain ε_{33}=-2.0

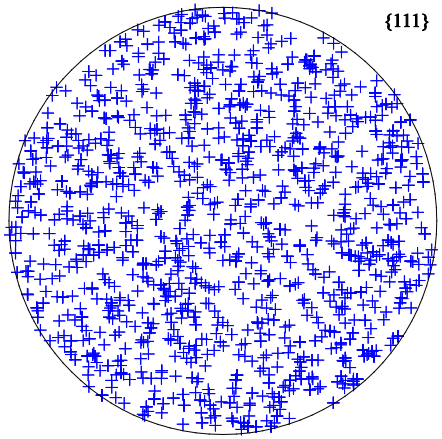


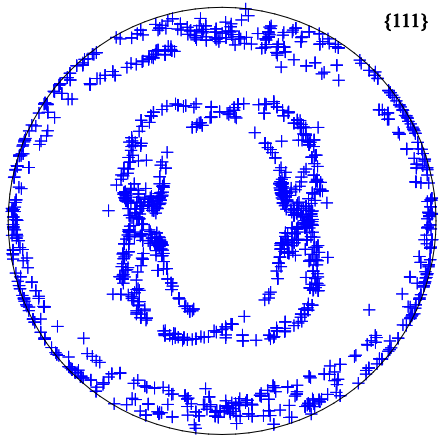


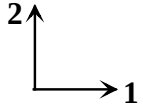










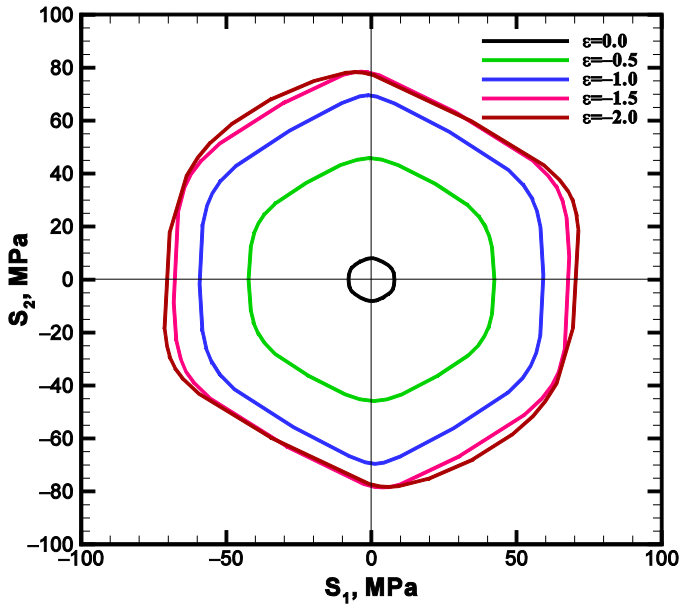


initial orientation

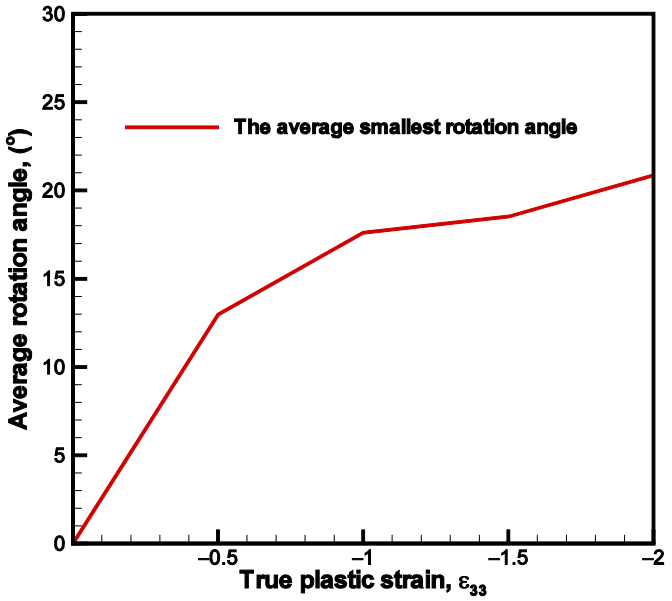
orientation
at strain ε_{33}=-2.0

stress-strain behavior

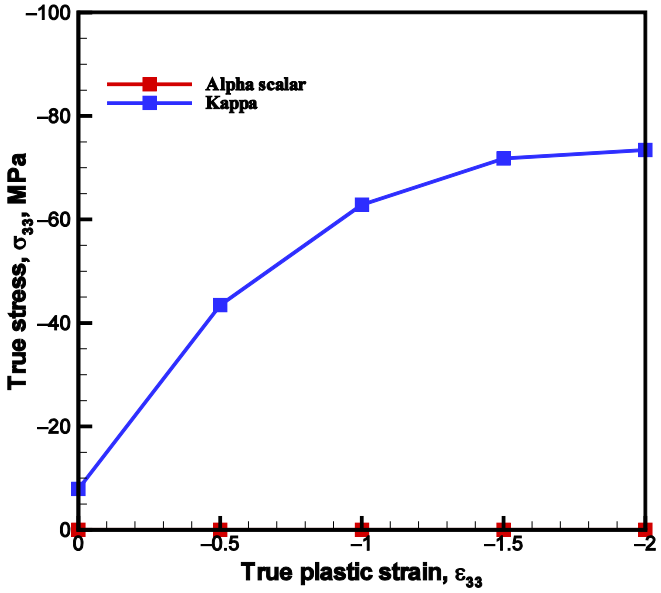
yield surface, average rotation angle, alpha and kappa hardening predictions



Yield surface at various strain levels



Average rotation angle (°)

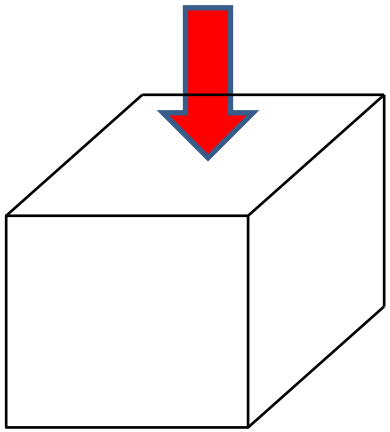


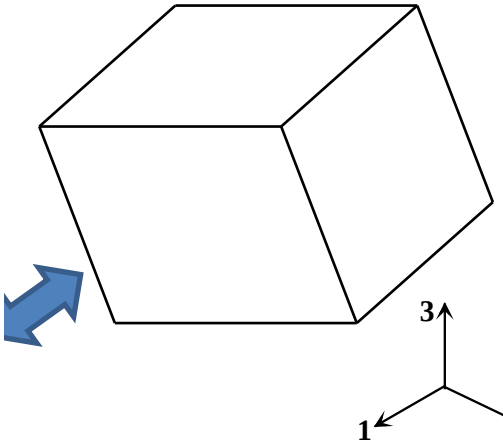
Alpha and Kappa hardening curves

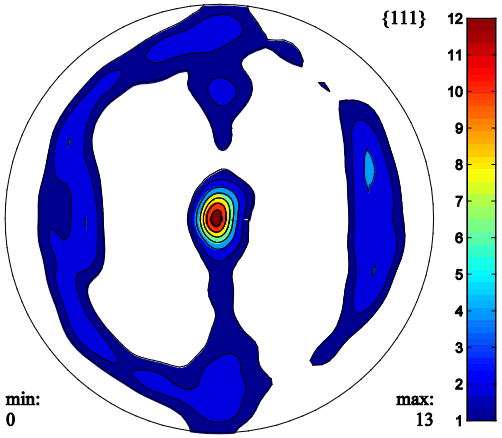
Uniaxial compression

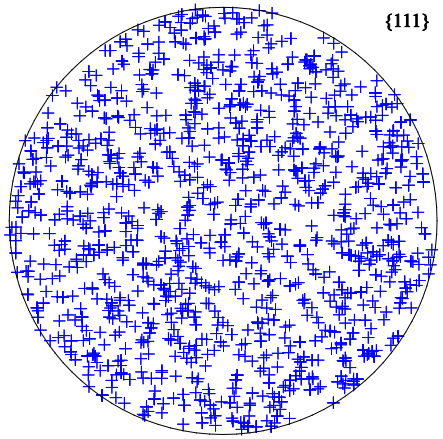
deformation

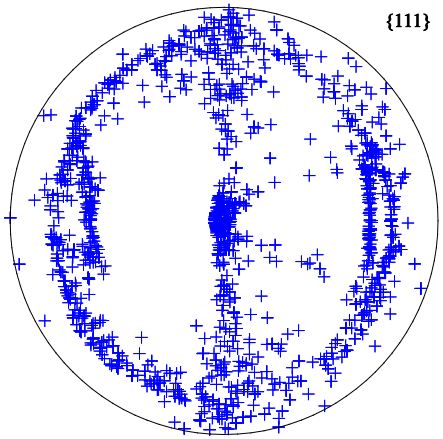
shear state at strain $\varepsilon_{13}=2.0$

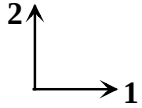


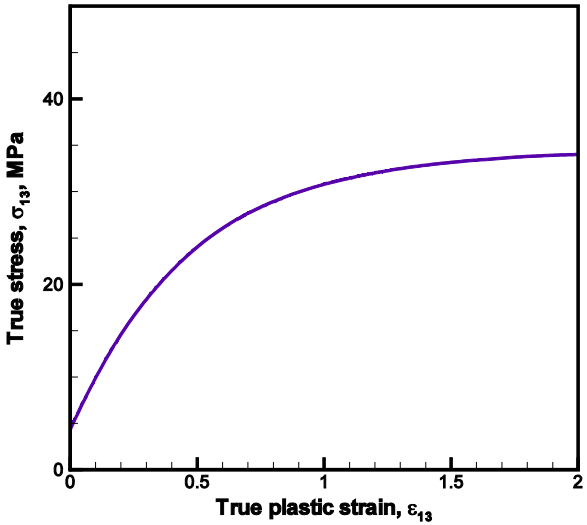












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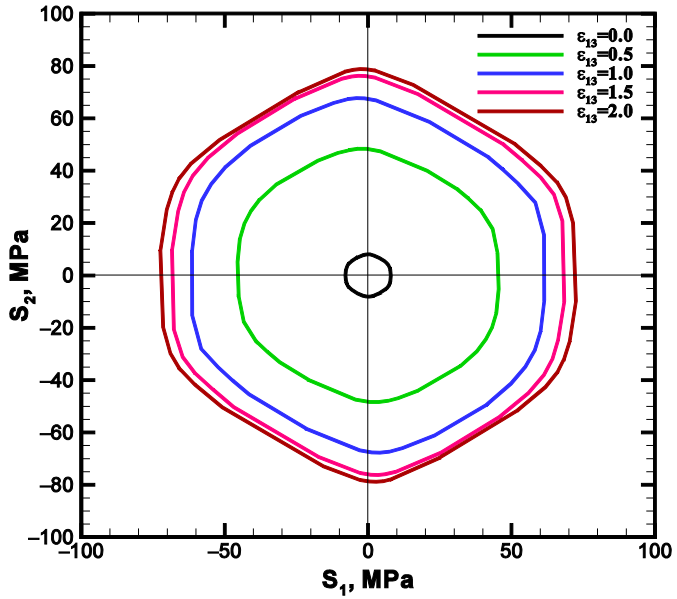

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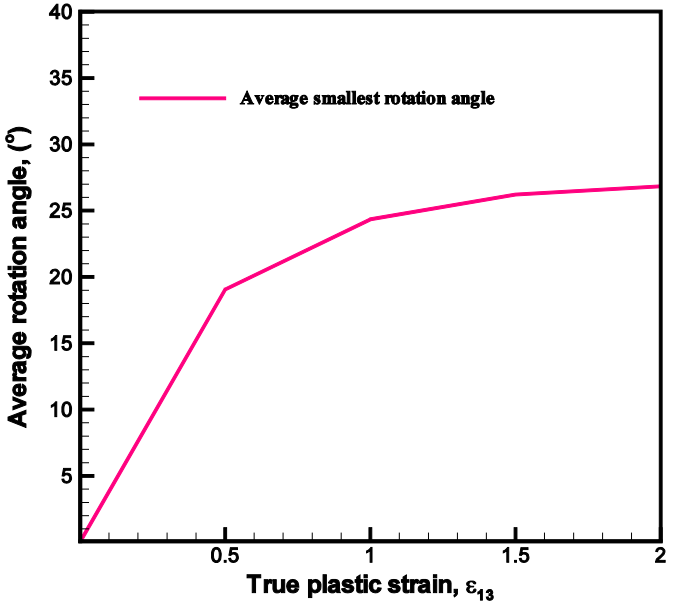

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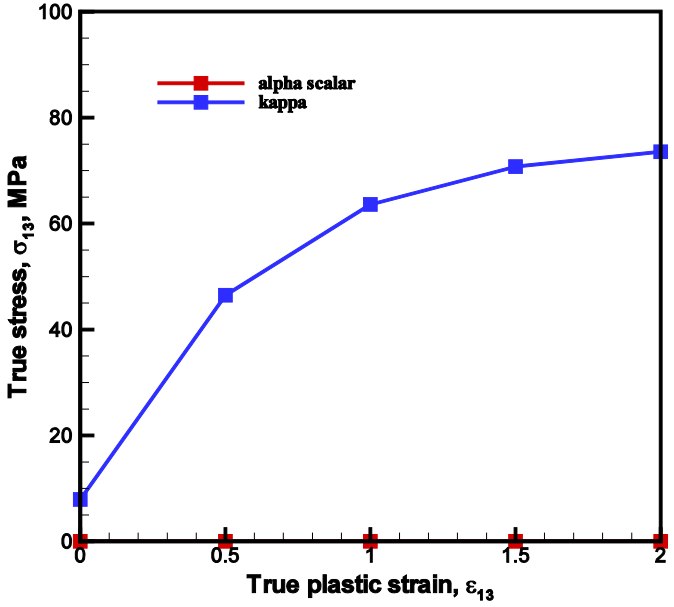

Simple shear

Alpha and Kappa hardening curves