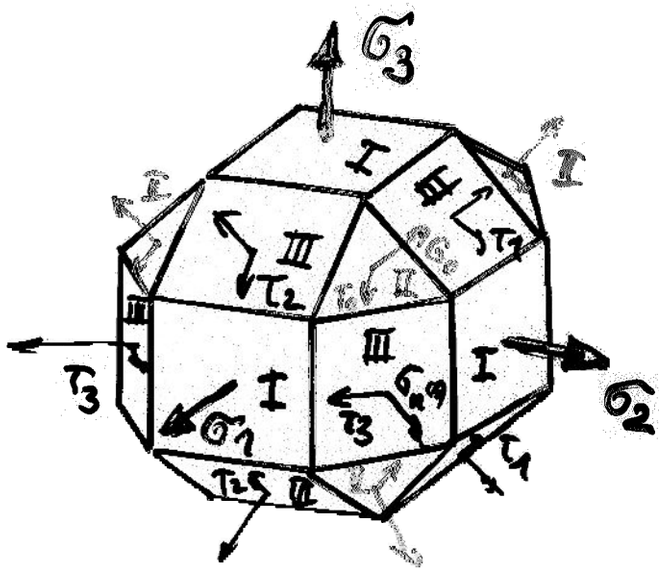
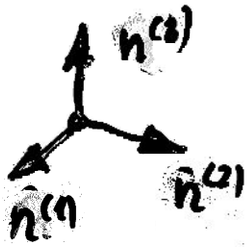
Geometrische Illustration:





Hauptrichtungen (principal directions)
Hauptachsen

I = Hauptebenen (principal planes)

II = Oktaederebenen (octahedral planes)

$\sigma_0 = \sigma_{oct} = \frac{1}{3}(\sigma_1 + \sigma_2 + \sigma_3) = p$

$\tau_0 = \tau_{oct} = \sqrt{\frac{2}{3}(-I_2(\sigma))} = \sqrt{\frac{2}{3}}\,\tau_I$

$\tau_I = \sqrt{-I_2(\sigma)}$ – Schubspannungsintensität
(intensity of shear stresses)

III = Ebenen der extremalen Schubspannungen:

$\tau_1 = \frac{\sigma_2 - \sigma_3}{2}$, $\tau_2 = \frac{\sigma_1 - \sigma_3}{2}$, $\tau_3 = \frac{\sigma_1 - \sigma_3}{2}$

$\sigma_{n(1)} = \frac{\sigma_2 + \sigma_3}{2}$, $\sigma_{n(2)} = \frac{\sigma_1 + \sigma_3}{2}$, $\sigma_{n(3)} = \frac{\sigma_1 + \sigma_3}{2}$