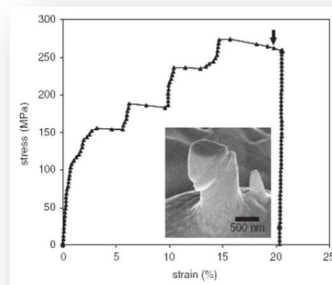




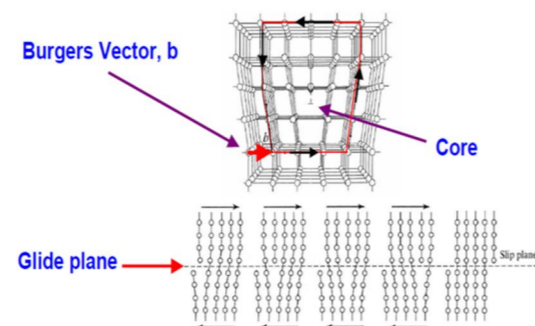
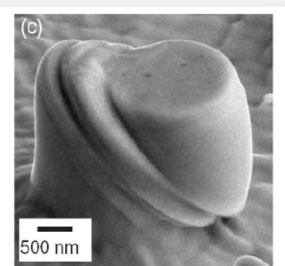
“Anisotropic Dislocation Dynamics by XFEM”
 S. Malek Afzali and S. Mohammadi

Isotropic Dislocation Dynamics

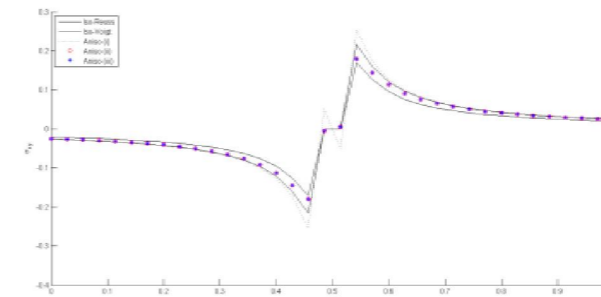
Moving dislocations cause plasticity



Volkert, Phil Mag. 2006

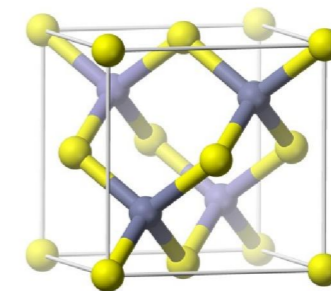


Anisotropic Dislocation Dynamics

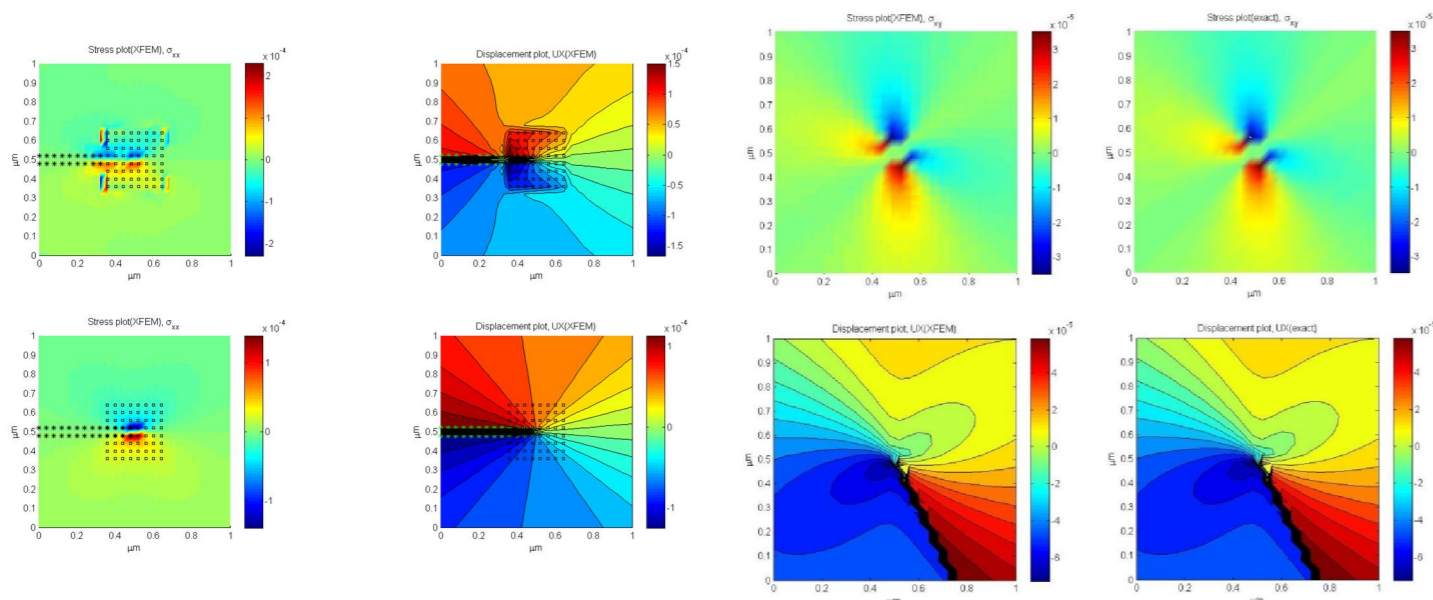
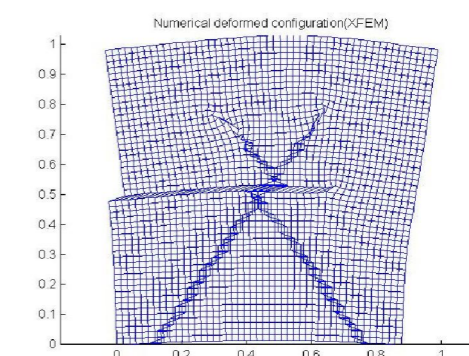
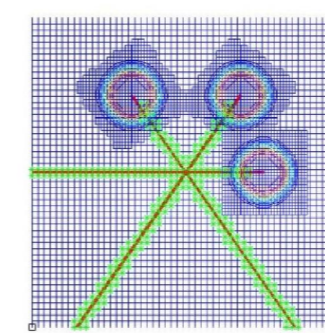


Non-uniform shear stress on the glide plane due to different average measures and different plane strain systems

$$\{c\} = \begin{bmatrix} c_{11} & c_{12} & c_{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ c_{12} & c_{11} & c_{12} & 0 & 0 & 0 & 0 & 0 & 0 \\ c_{12} & c_{12} & c_{11} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & c_{44} & 0 & 0 & c_{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & c_{44} & 0 & 0 & c_{44} & 0 \\ 0 & 0 & 0 & 0 & 0 & c_{44} & 0 & 0 & c_{44} \\ 0 & 0 & 0 & c_{44} & 0 & 0 & c_{44} & 0 & 0 \\ 0 & 0 & 0 & 0 & c_{44} & 0 & 0 & c_{44} & 0 \\ 0 & 0 & 0 & 0 & 0 & c_{44} & 0 & 0 & c_{44} \end{bmatrix}$$

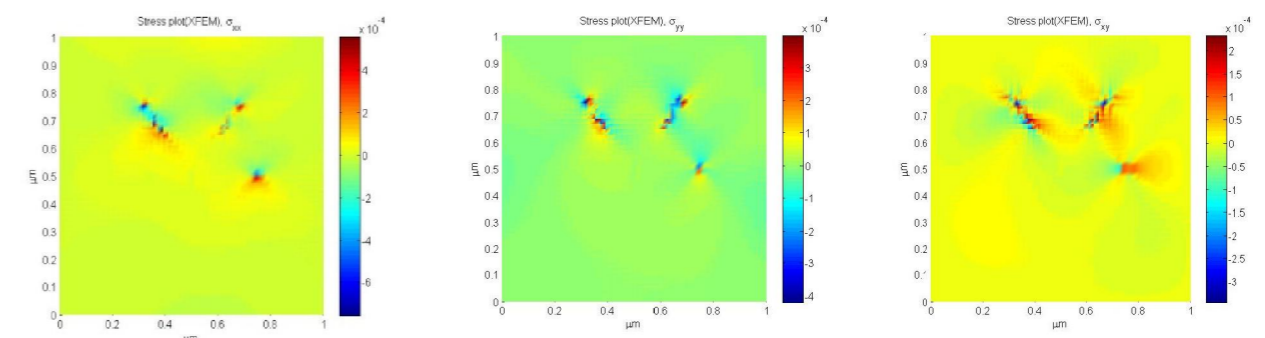


Compliance matrix for a FCC crystal



using ramp function on blended elements

Inclined dislocation in an infinite isotropic medium



Multi dislocations in an anisotropic medium