Continuum Elastoplasticity - Finite Strain

Shear example

Domain: $5 \times 1 \times 1$

Mesh: $80 \times 16 \times 16$

Boundary conditions: $\boldsymbol{u} = 0$ at $x_3 = 0$; $\boldsymbol{u} = 0.5\boldsymbol{e}_1$ at $x_3 = 1$

$u_2 = u_3 = 0$ at $x_1 = 0$, $x_1 = 5$, $x_2 = 0$, and $x_2 = 1$.

Parameter	Value
Lamé constant λ	100.6582e9
Lamé constant μ	45.6473e9
Yield stress	33.014025e6
Linear hardening coefficient	2.0259e9
Basis function order	1
Quadrature order	2
Pseudo-time steps	50

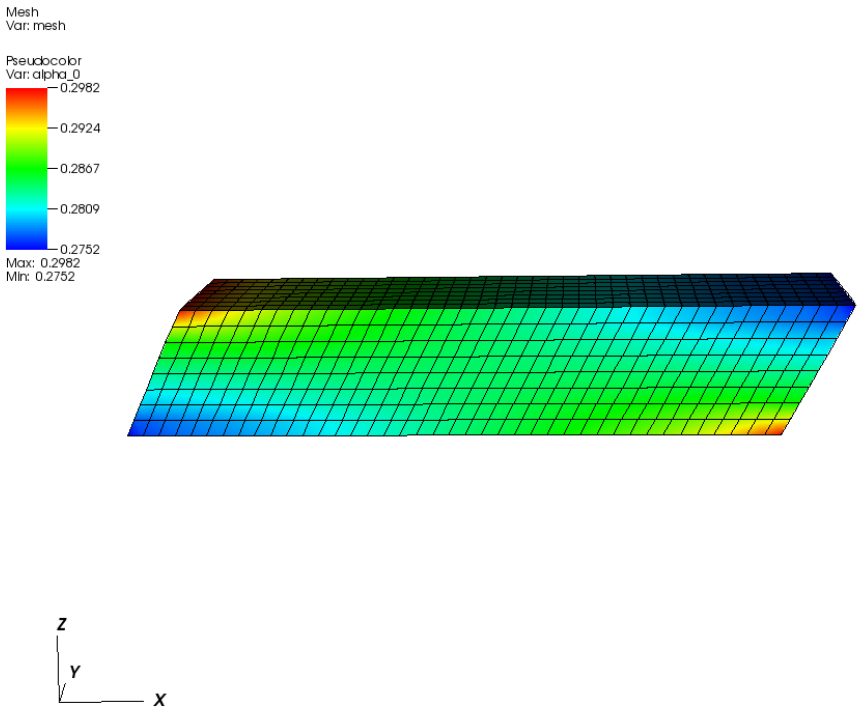

Figure 1: Plot of equivalent plastic strain, α. Deformation scaled by $1\times$.

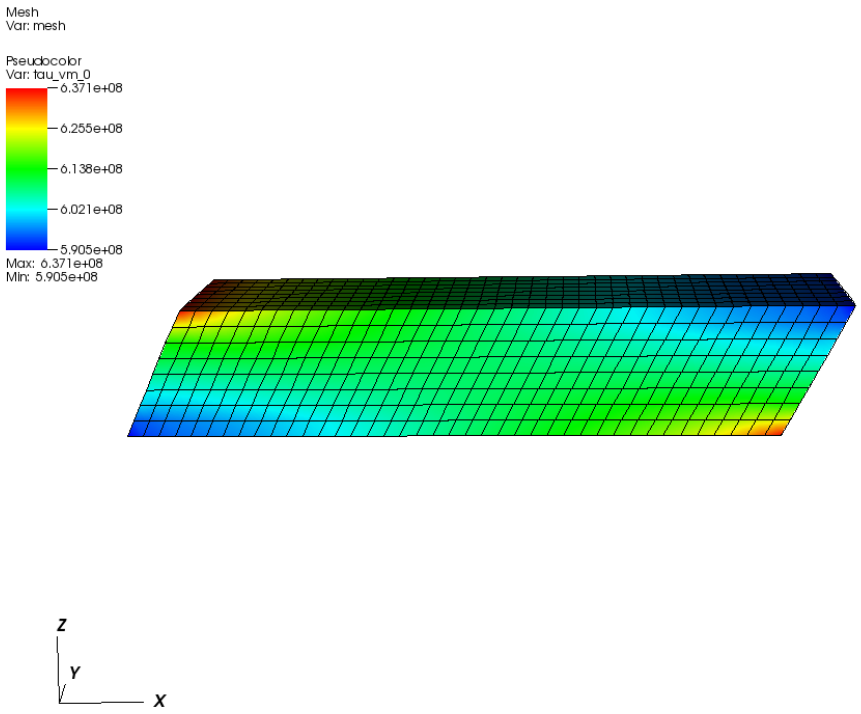

Figure 2: Plot of von Mises stress. Deformation scaled by 1×.

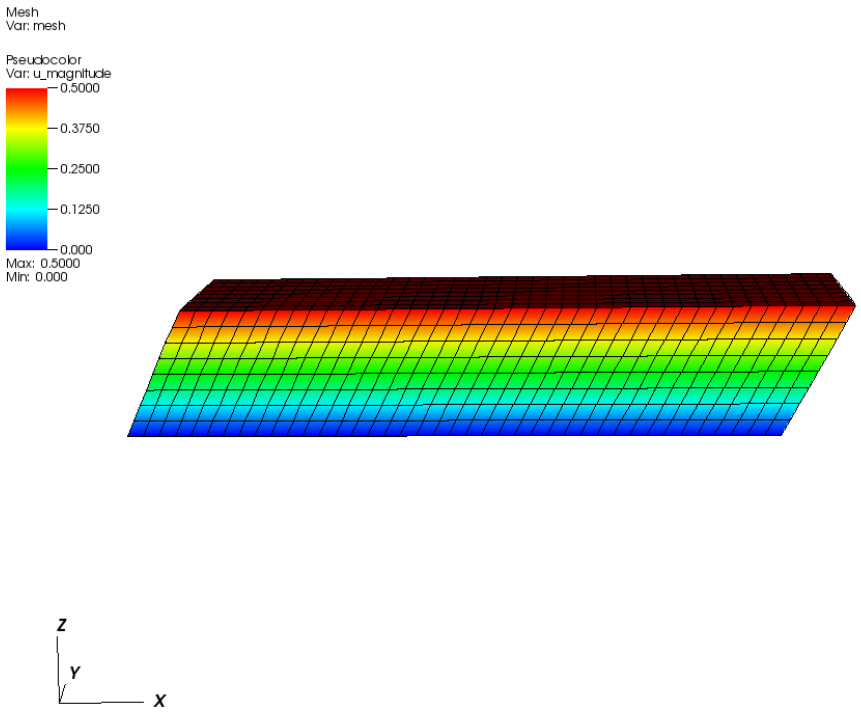

Figure 3: Plot of displacement magnitude. Deformation scaled by $1\times$.