25.4 AN EXAMPLE PROBLEM FOR STRESS

The input data and the computer output for a small two-dimensional elasticity problem are given in this section. The problem consists of a plate with a load applied over a segment of one side and continuously supported along the opposite side (Figure 25.3). The elements and node numbers are given in Figure 25.4.
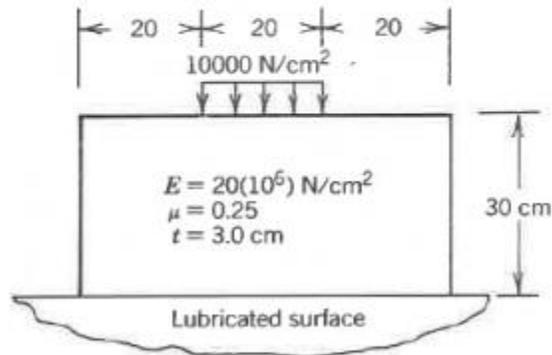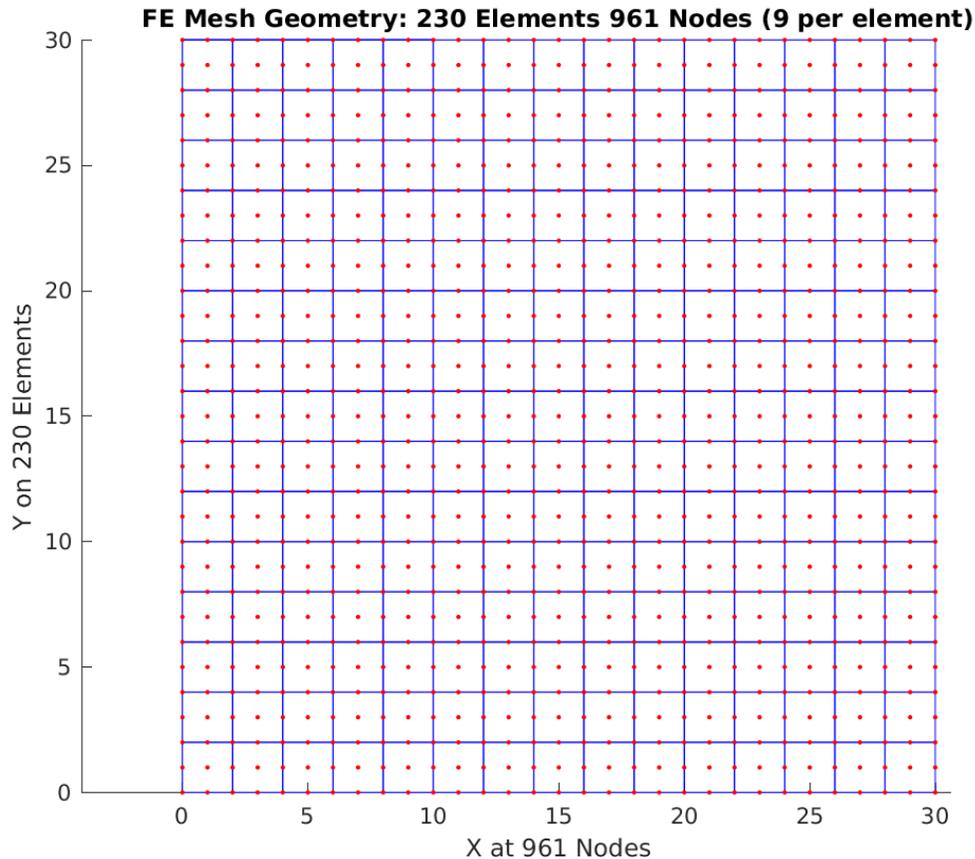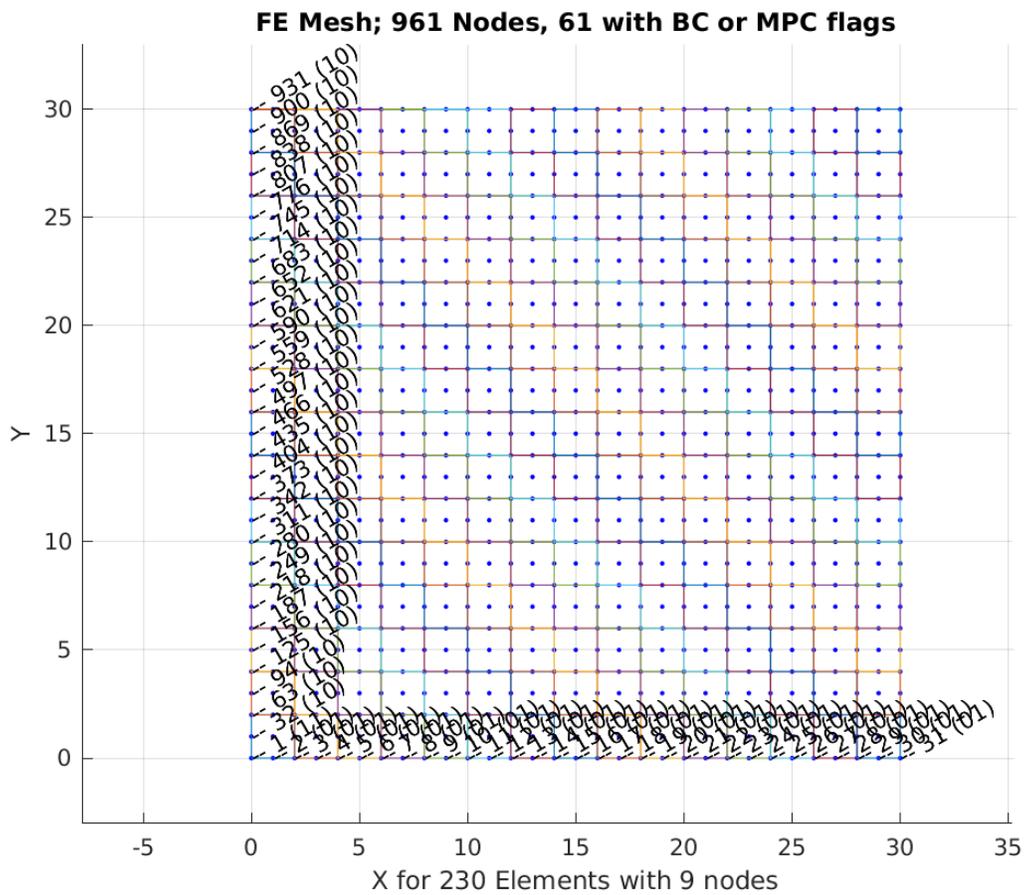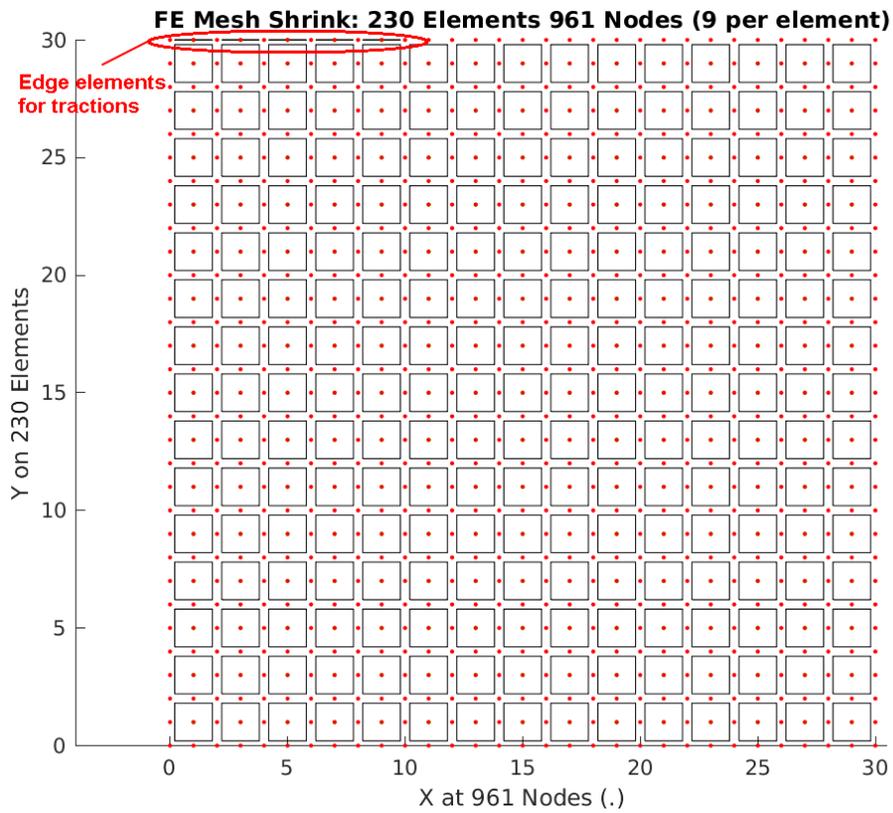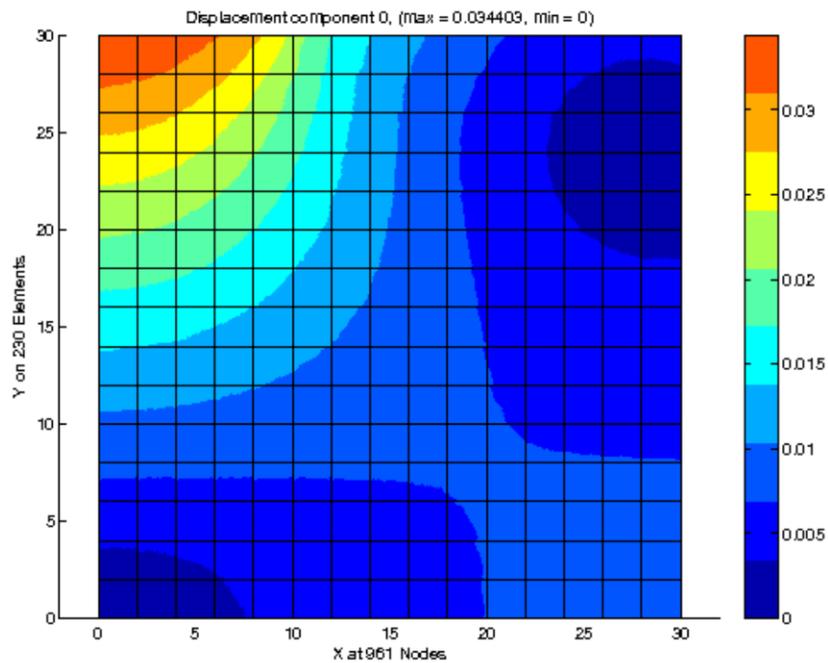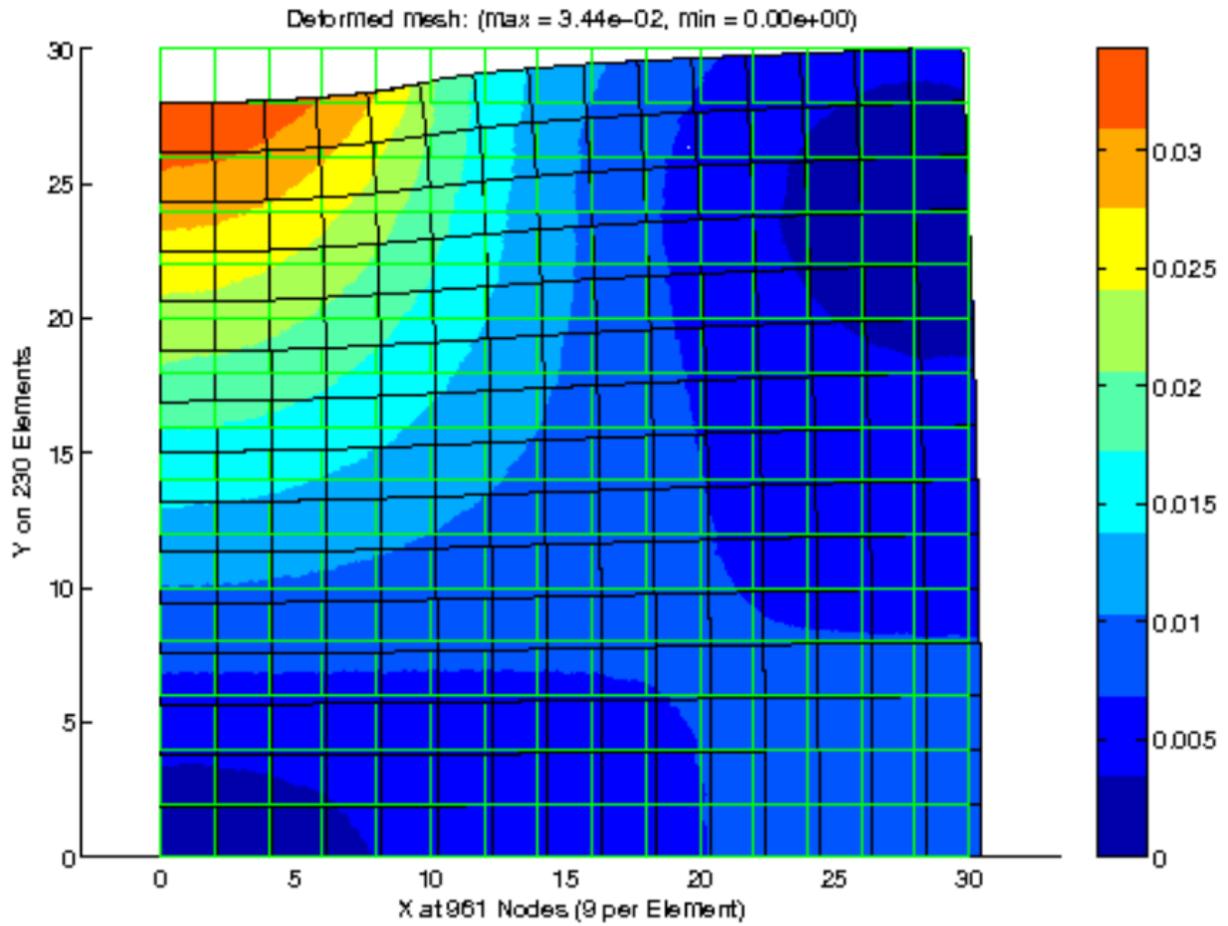

Figure 25.3. A thin plate with a distributed load over part of one side.
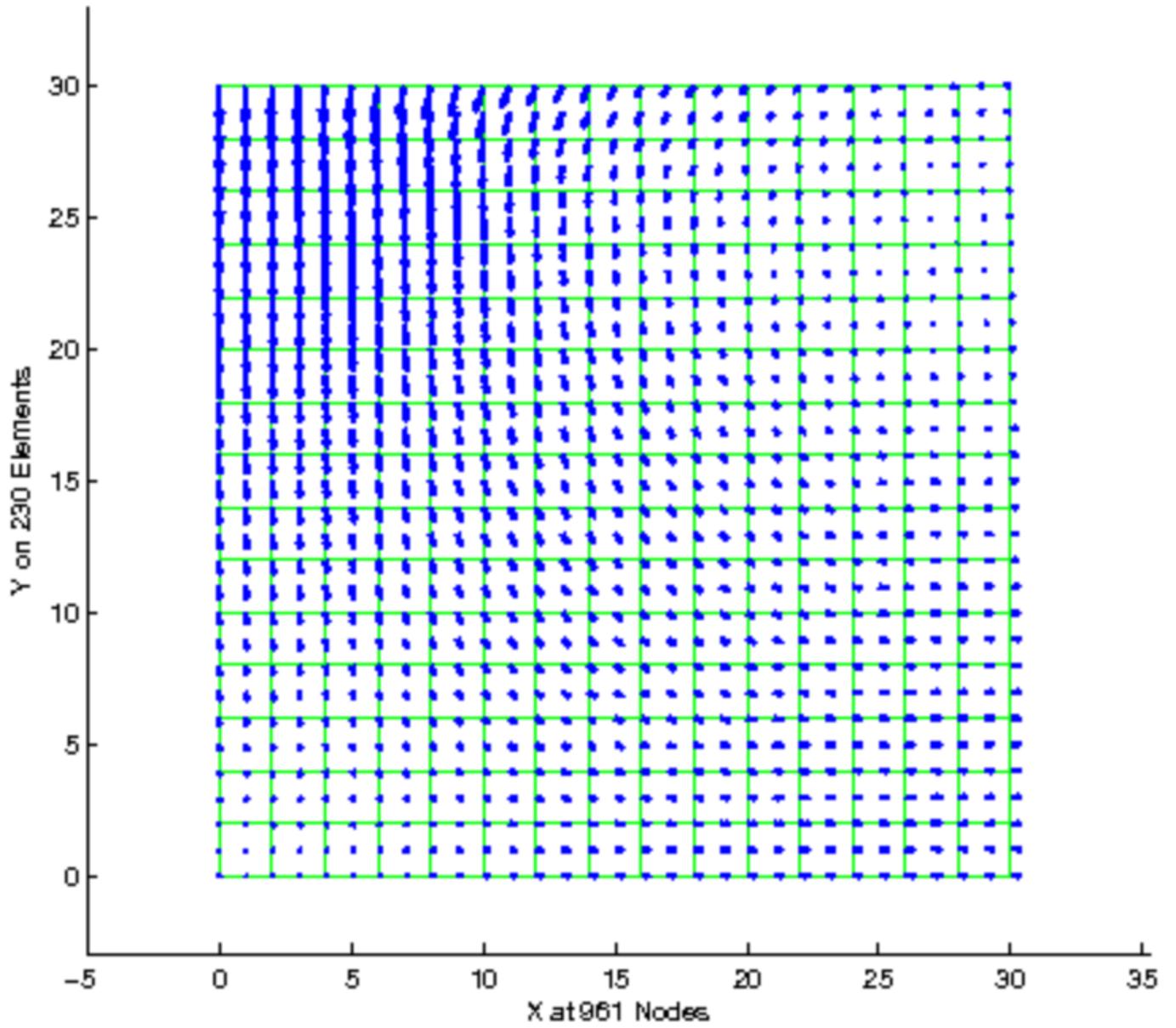
This example was solved with 225 quadratic quadrilaterals (Q9) area stress elements and five quadratic traction line elements (L3) via numerical integration giving the following plots. Half symmetry was used.
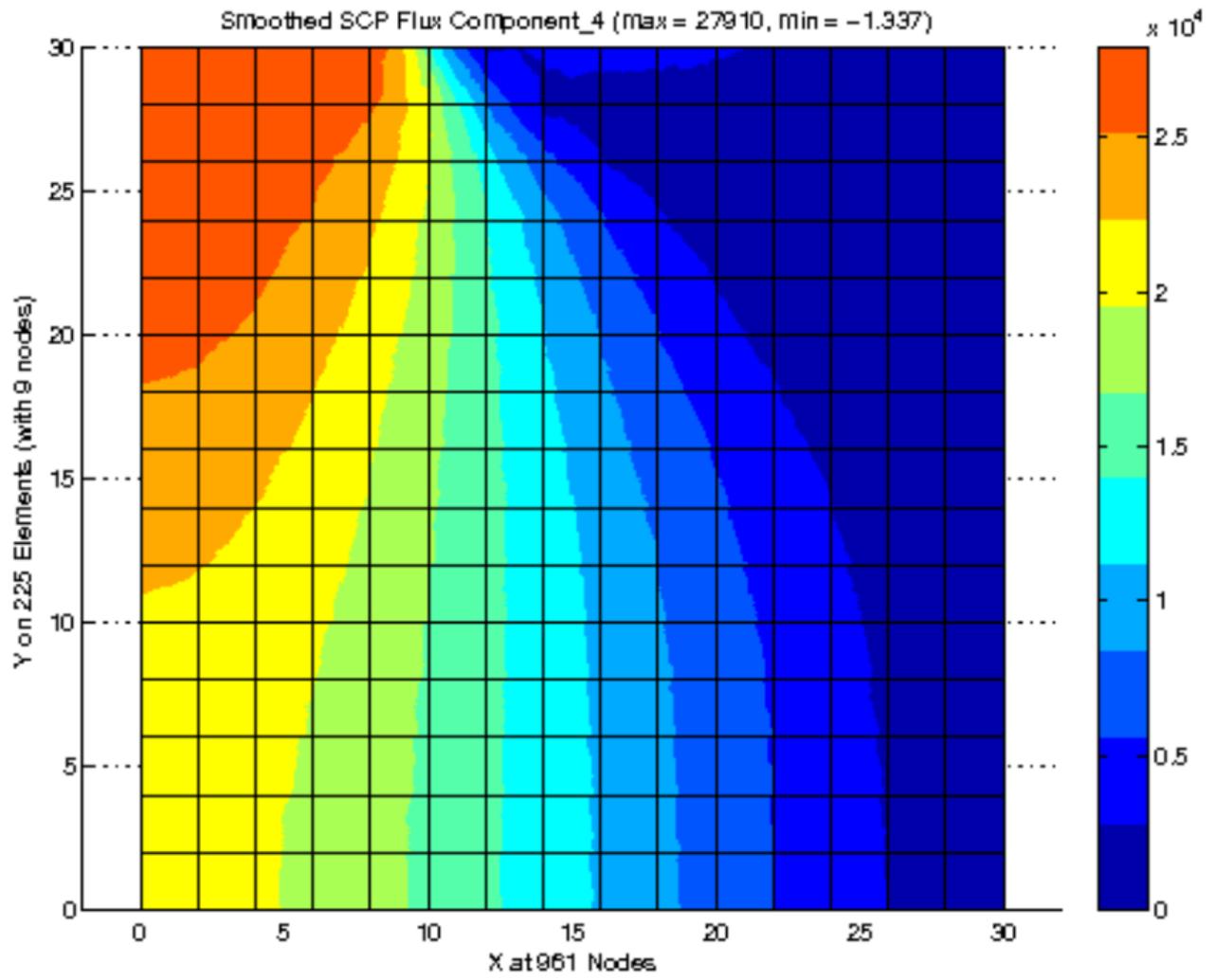
FE Mesh Shrink: 230 Elements 961 Nodes (9 per element)

Edge elements for tractions

Y on 230 Elements

X at 961 Nodes (.)

FE Mesh; 961 Nodes, 61 with BC or MPC flags

Y

X for 230 Elements with 9 nodes

Deformed mesh: (max = 3.44e-02, min = 0.00e+00)

Y on 230 Elements

X at 961 Nodes (9 per Element)

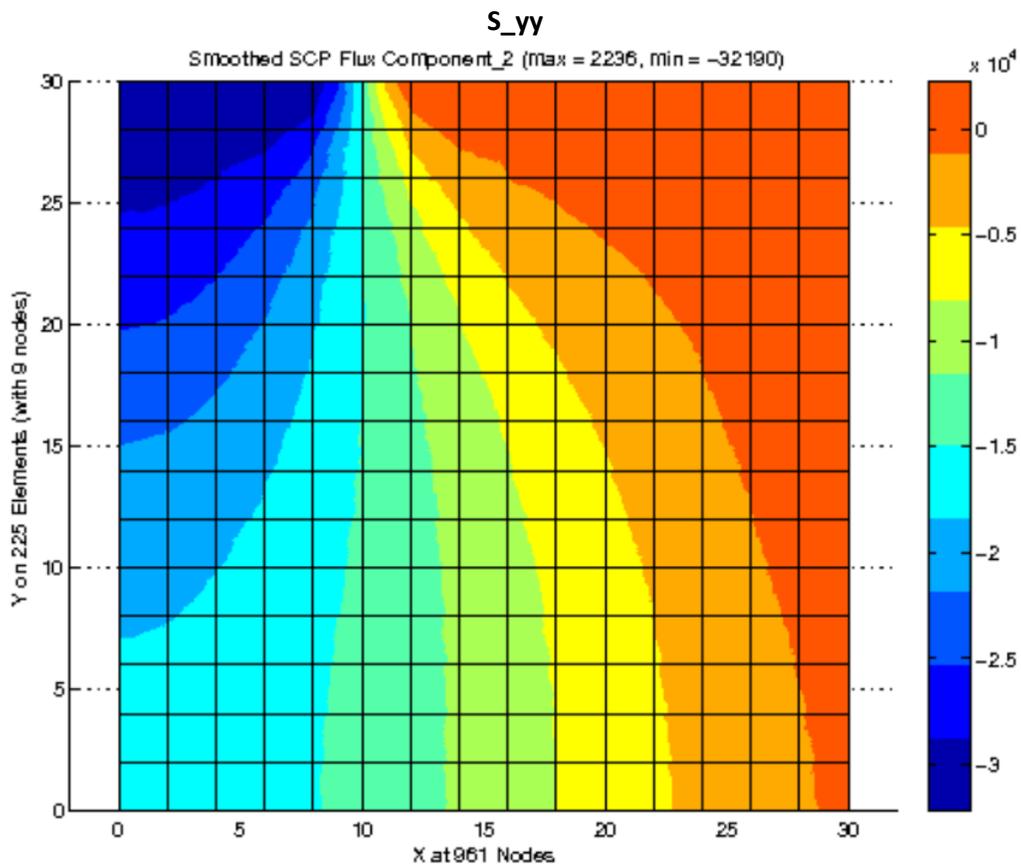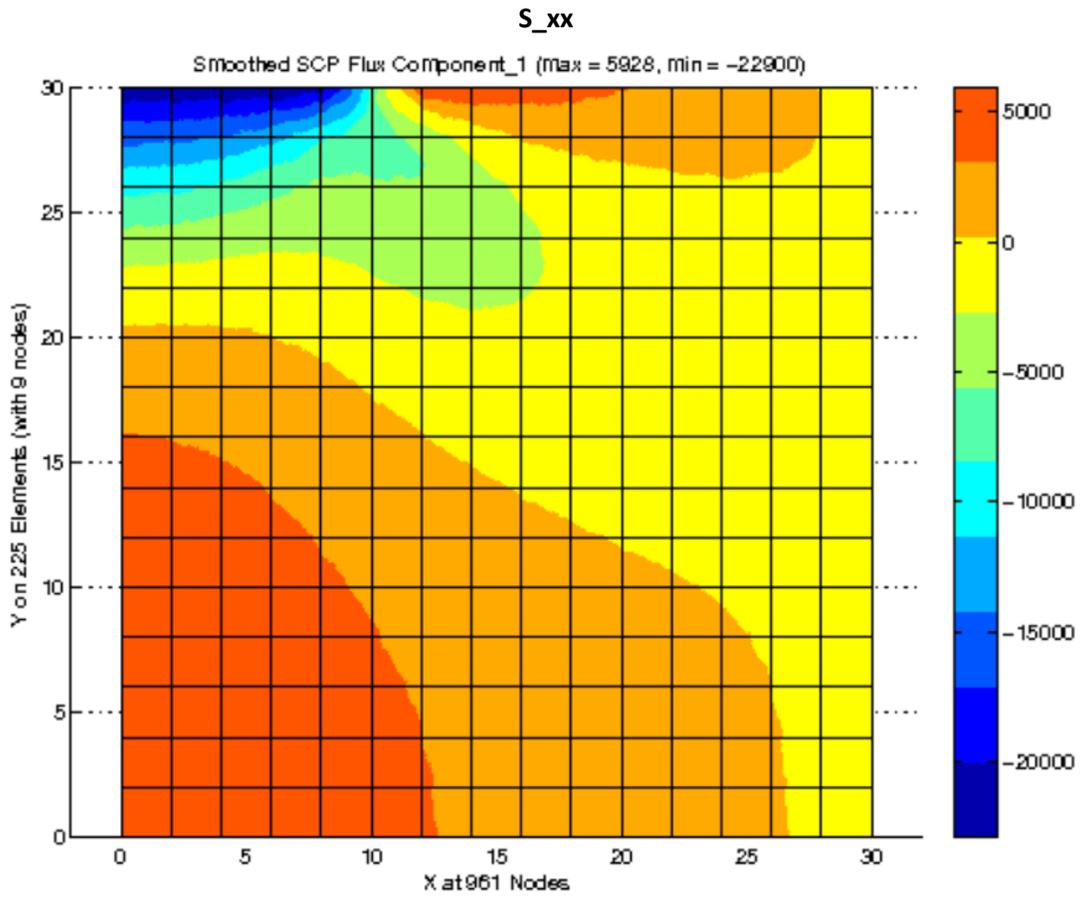Displacement component 0, (max = 0.034403, min = 0)

Y on 230 Elements

X at 961 Nodes

Node Vectors and Mesh: (max = 3.44e-02, min = 0)

Von Misses equivalent stress

Smoothed SCP Flux Component_4 (max = 27910, min = −1.337)

S_xx

Smoothed SCP Flux Component_1 (max = 5928, min = –22900)

S_yy

Smoothed SCP Flux Component_2 (max = 2236, min = –32190)

Smoothed SCP Flux Component_3 (max = 8771, min = −1228)