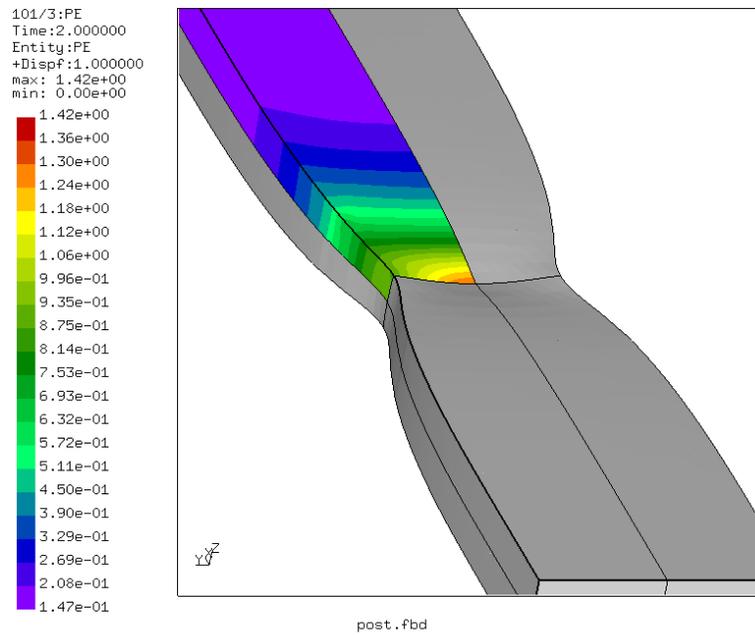
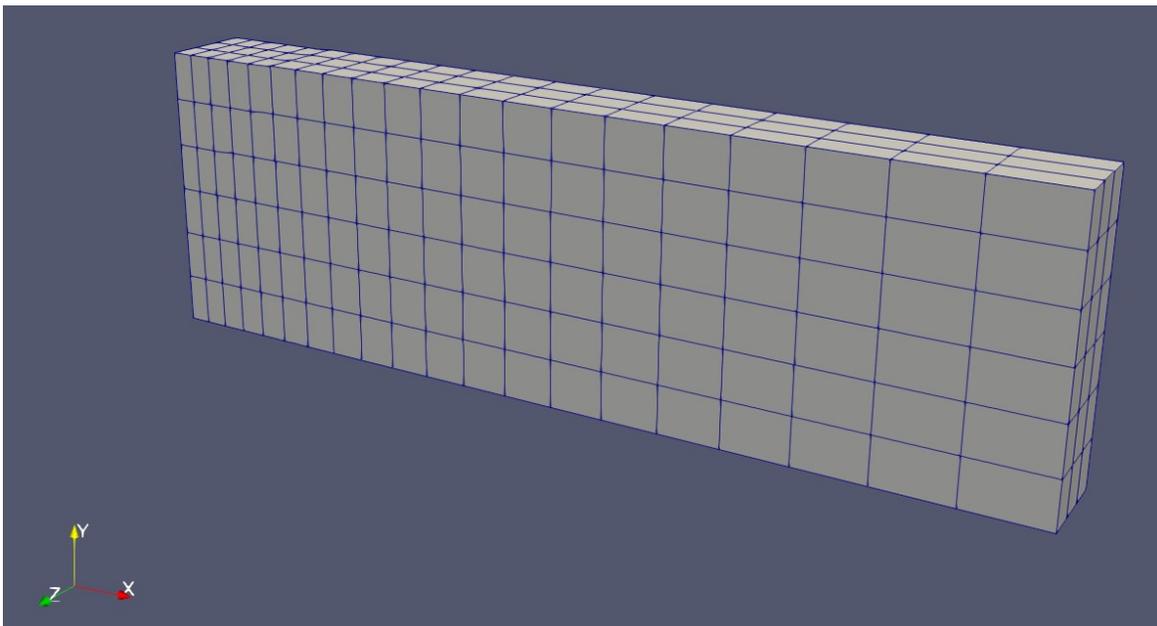


Tensile test of a 8x25mm steel bar. The yield curve is obtained from real test data and the simulated stress-strain curve is compared to the experimental one.

Using symmetry, the structure is reduced to one eighth of the original one.

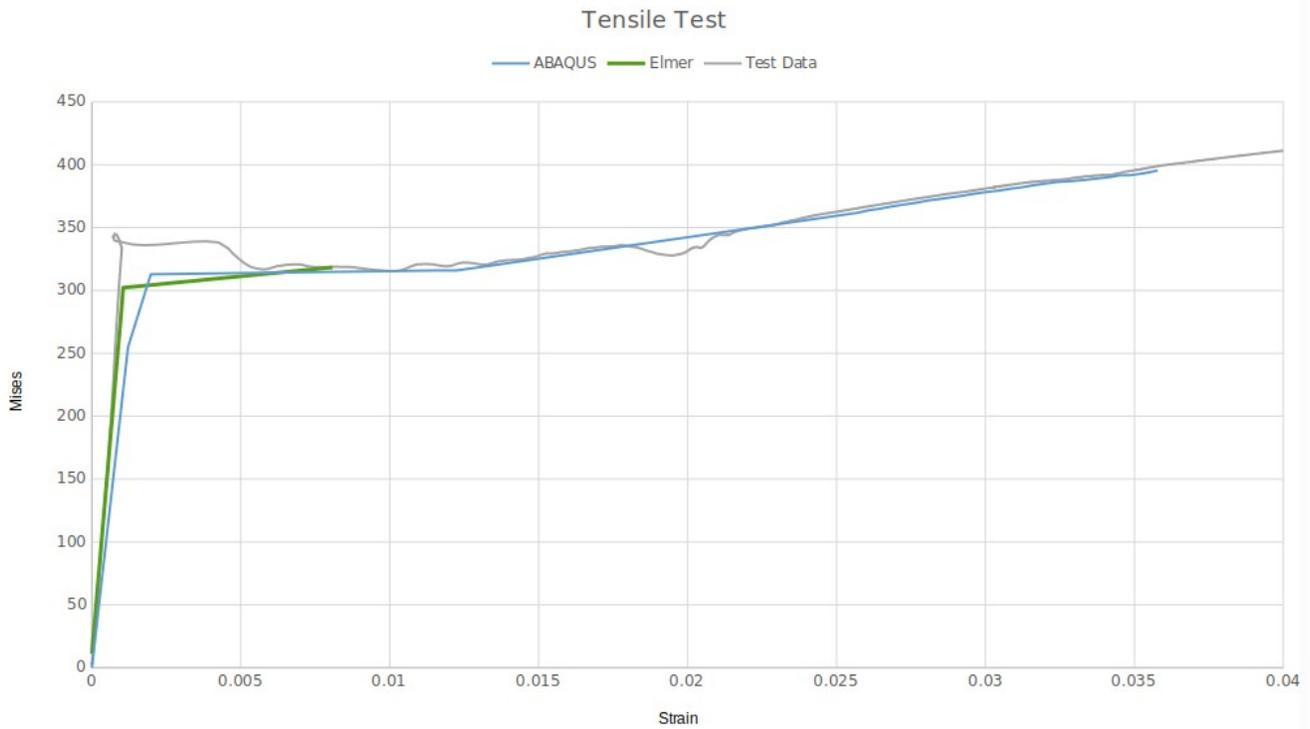


The model has planes of symmetry on X, Y, and Z and is held on one end while being pulled by enforced displacement on the other. 20 Node quadratic solid elements are used.



The model has a slight imperfection at the top left to ensure the necking occurs.

The model has been previously validated in Calculix and ABAQUS. The results below demonstrate the use of Elmer with a bi-linear stress strain curve input using a UMAT Subroutine with Elastic Solver.



The bi-linear model is effective for early plasticity. The graph compares Elmer to actual test data and an Abaqus simulation. A more general UMAT would be required for full plastic behavior.

