Problem 2:
Taylor Impact

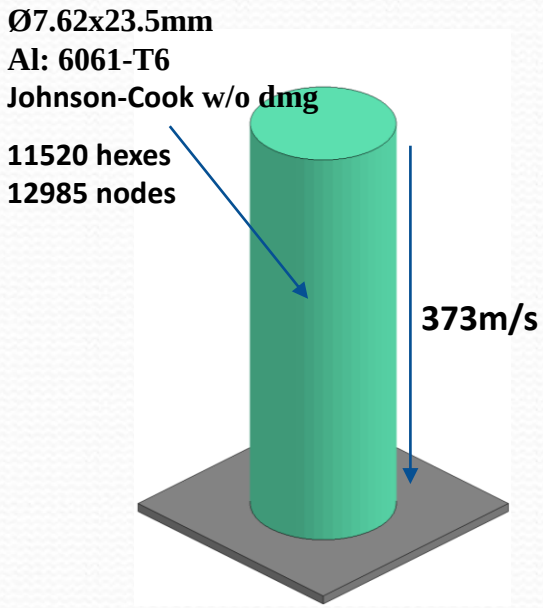
Objectives:

1. Understand the difference between Lagrangian and Eulerian kernels
2. Evaluate the effect of support size
3. Validate against experimental data (max length reduction)

To do list:

You are expected to do the following studies by ***Beta***:

1. Create a new directory under Example 2 & copy ***input_taybar.k***.
2. Obtain results by setting DX/DY/DZ=1.4 & KERNEL=0.
3. Create another directory and copy ***input_taybar.k.***
4. Obtain results by setting DX/DY/DZ=1.6 & KERNEL=0.
6. Plot z-displacement from the time history file "nodout" and compare with test data (max reduction is 6.97mm), evaluate the accuracy of the SPG formulation.
7. Create another directory and copy ***input_taybar.k***.
8. Obtain results by setting DX/DY/DZ=1.6 & KERNEL=1.
9. Understand and explain the results.



Input file: ***input_taybar.k***

Wilkins ML, Guinan MW. "Impact of cylinders on a rigid boundary," J. Appl Phys, 44, p1200-1206, 1973

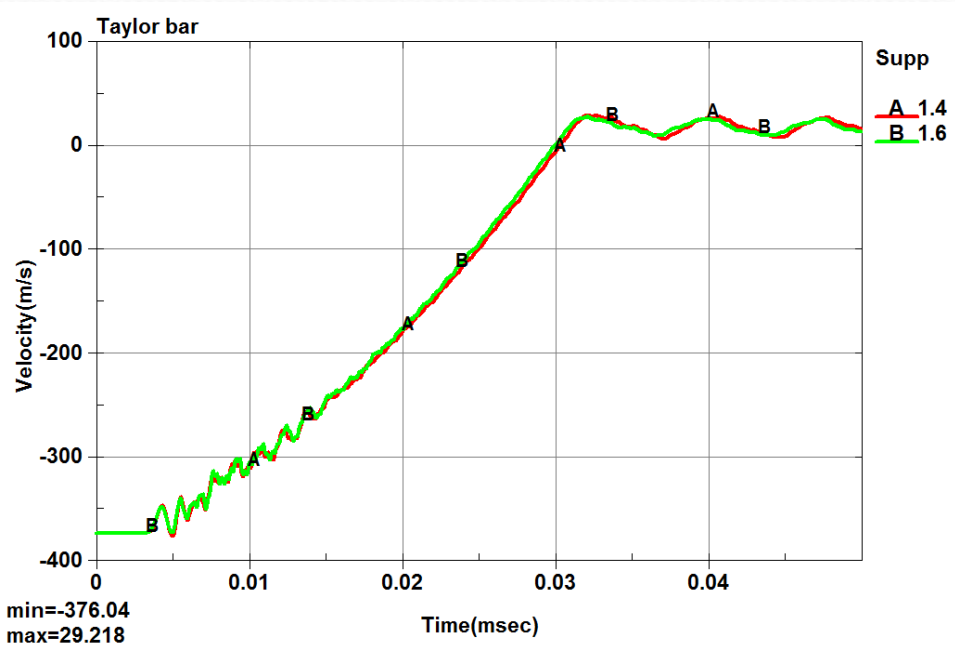
Major Keywords for Taylor Impact

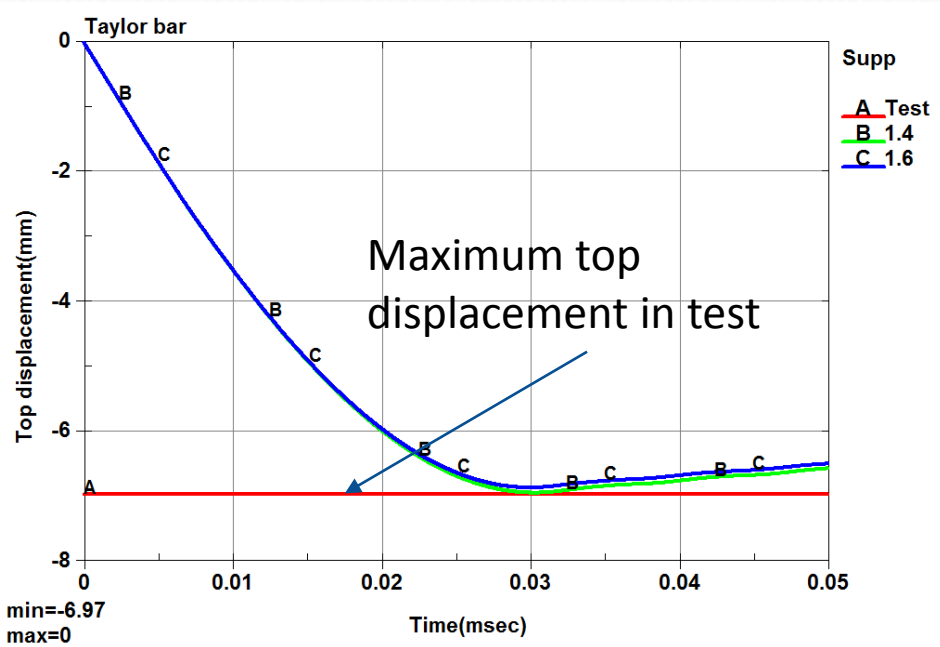
Keyword	Remark
*SECTION_SOLID_SPG $# secid elform aet 1 47 0 $# DX DY DZ ISPLINE KERNEL LSCALE SMSTEP SWTIME 1.4 1.4 1.4 0 0 0.0 30 0.0 $ IDAM FS STRETCH ITB 1 1.0E+90 1.10 1	Updated Lagrangian kernel Non-failure analysis DX=DY=DZ=1.4 Response for normalized support size = 1.4
*SECTION_SOLID_SPG $# secid elform aet 1 47 0 $# DX DY DZ ISPLINE KERNEL LSCALE SMSTEP SWTIME 1.6 1.6 1.6 0 0 0.0 30 0.0 $ IDAM FS STRETCH ITB 1 1.0E+90 1.10 1	Updated Lagrangian kernel Non-failure analysis DX=DY=DZ=1.6 Response for normalized support size = 1.6
*SECTION_SOLID_SPG $# secid elform aet 1 47 0 $# DX DY DZ ISPLINE KERNEL LSCALE SMSTEP SWTIME 1.6 1.6 1.6 0 1 0.0 30 0.0 $ IDAM FS STRETCH ITB 1 1.0E+90 1.10 1	Eulerian kernel Non-failure analysis DX=DY=DZ=1.6 Response for normalized support size = 1.6 Tension instability

By default, TSSFAC=0.9, and ITB=1!

Bar Velocity and Top Displacement Histories

Legend: normalized support size

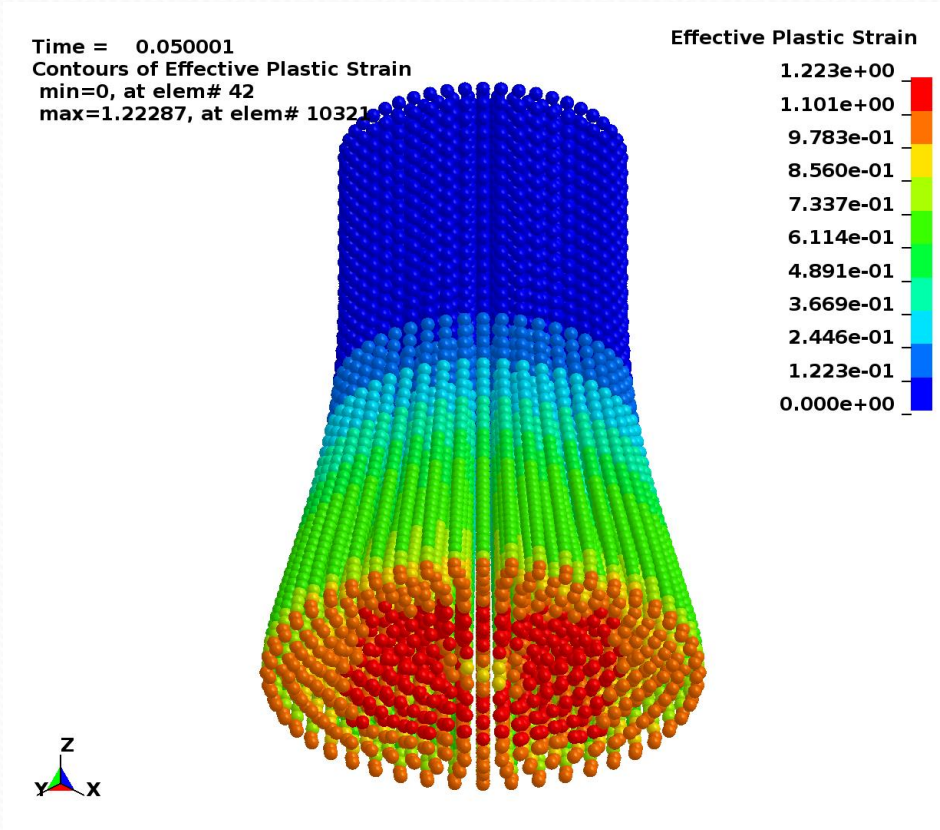




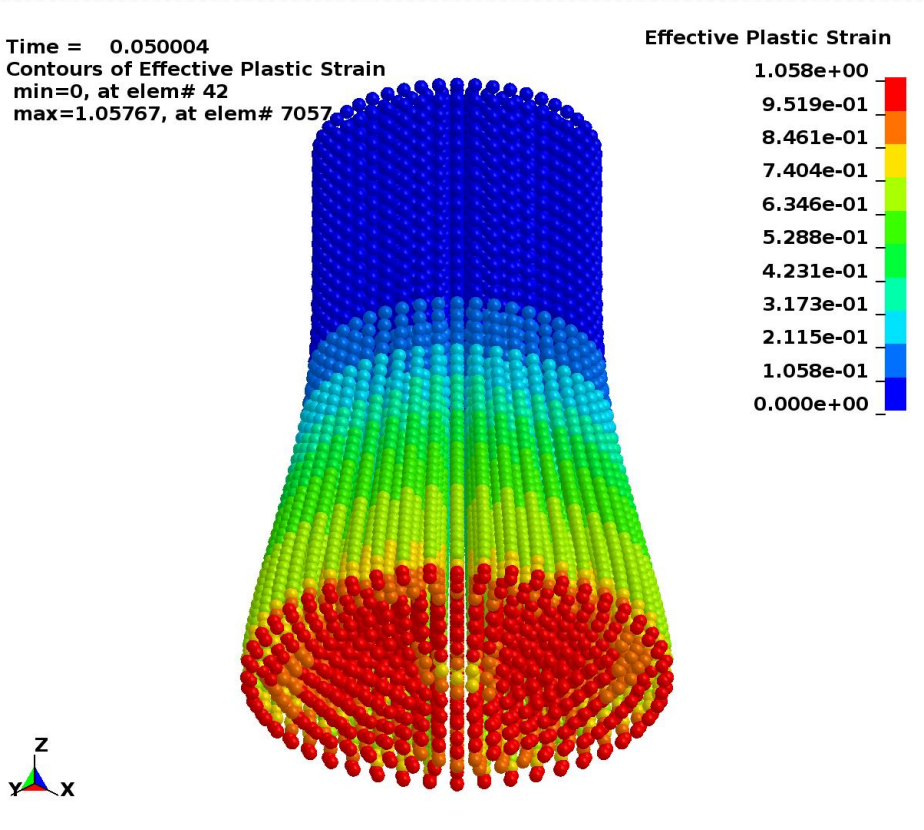
Bar velocity

Top surface displacement

Effective Plastic Strain at Termination



Supp1.4



Supp1.6