
ANSYS WORKBENCH分析应用基础
LESSON13 对称问题预备：水杯
课程制作 张 晔
QQ交流群：205237137

ANSYS WORKBENCH分析应用基础

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LESSON13 对称问题预备：水杯

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机械人读书笔记

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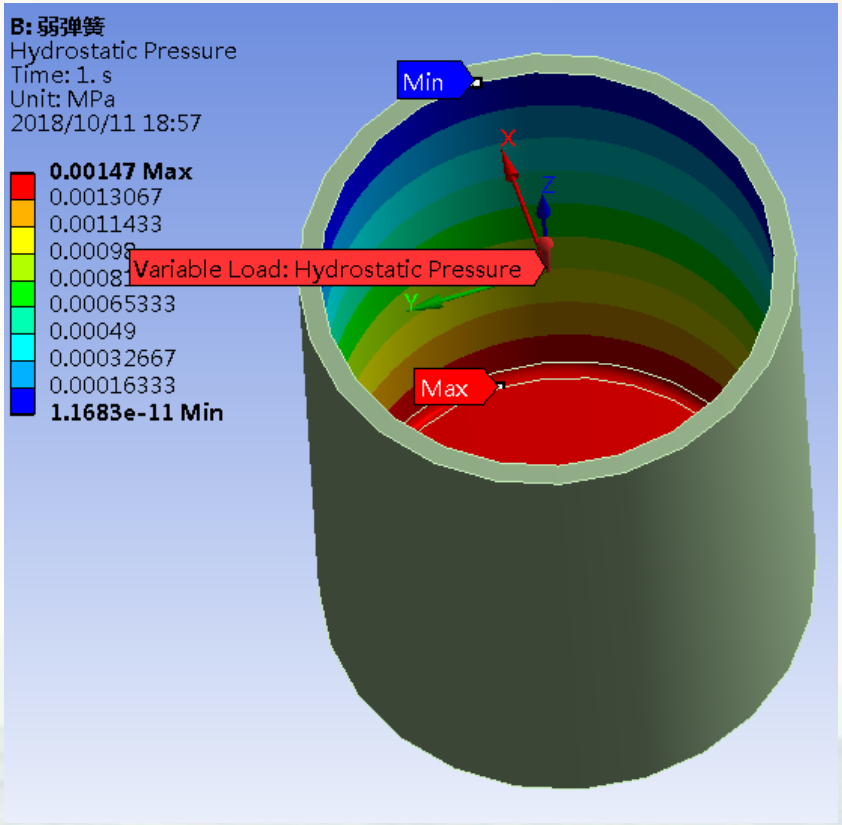
本课重点内容

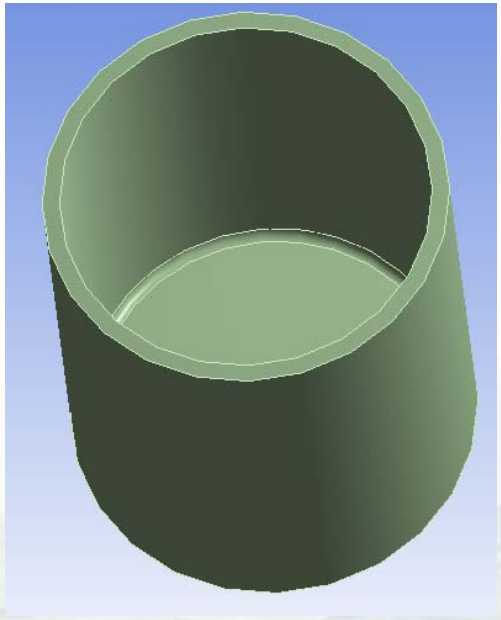
1. 全约束问题的使用
2. 水压设置和坐标系建立
3. 新建材料界面的初步了解

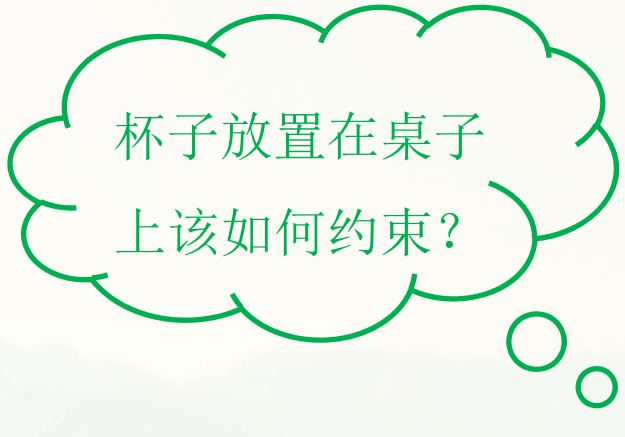


分析实例：水杯

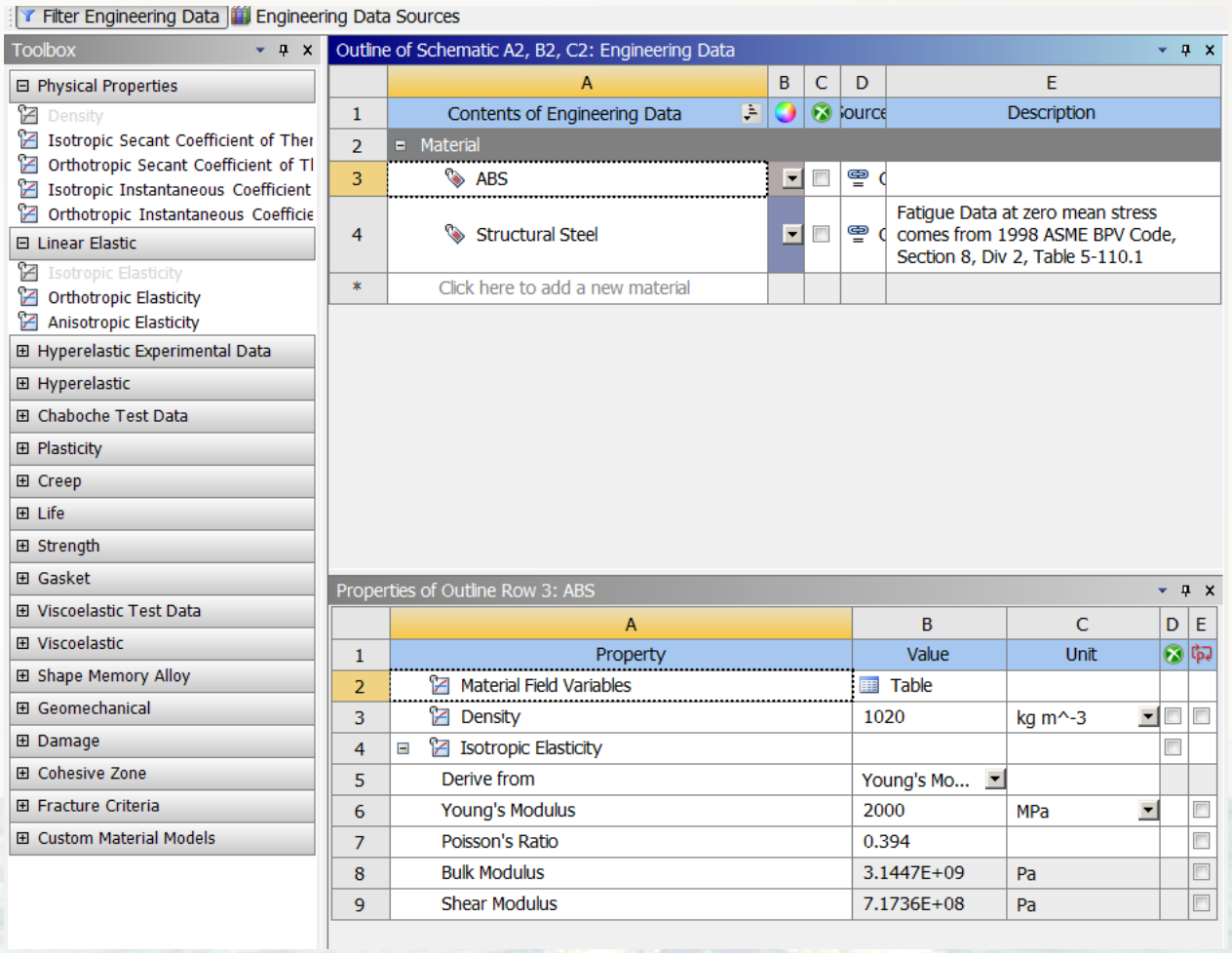
问题描述：杯子放置在桌子上，内部装满水，求杯子底部径向扩张量。

材料： ABS

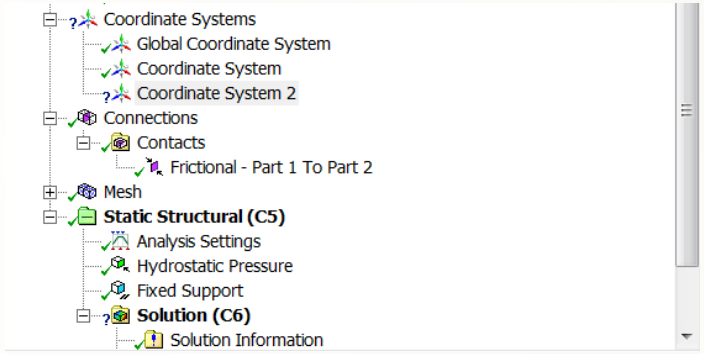




材料添加


Filter Engineering Data
Engineering Data Sources
Toolbox
Physical Properties
Density
Isotropic Secant Coefficient of Ther
Orthotropic Secant Coefficient of Tl
Isotropic Instantaneous Coefficient
Orthotropic Instantaneous Coefficie
Linear Elastic
Isotropic Elasticity
Orthotropic Elasticity
Anisotropic Elasticity
Hyperelastic Experimental Data
Hyperelastic
Chaboche Test Data
Plasticity
Creep
Life
Strength
Gasket
Viscoelastic Test Data
Viscoelastic
Shape Memory Alloy
Geomechanical
Damage
Cohesive Zone
Fracture Criteria
Custom Material Models
Outline of Schematic A2, B2, C2: Engineering Data
A
B
C
D
E
1
Contents of Engineering Data
Source
Description
2
Material
3
ABS
4
Structural Steel
Fatigue Data at zero mean stress comes from 1998 ASME BPV Code, Section 8, Div 2, Table 5-110.1
*
Click here to add a new material
Properties of Outline Row 3: ABS
A
B
C
D
E
1
Property
Value
Unit
2
Material Field Variables
Table
3
Density
1020
kg m^-3
4
Isotropic Elasticity
5
Derive from
Young's Mo...
6
Young's Modulus
2000
MPa
7
Poisson's Ratio
0.394
8
Bulk Modulus
3.1447E+09
Pa
9
Shear Modulus
7.1736E+08
Pa

坐标系创建和水压设置



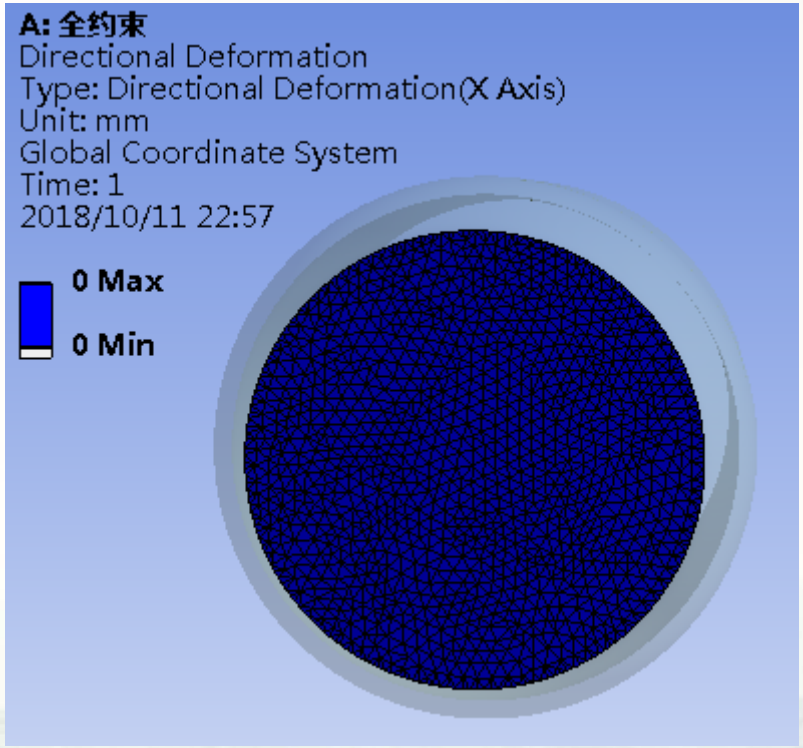
Details of "Coordinate System 2"

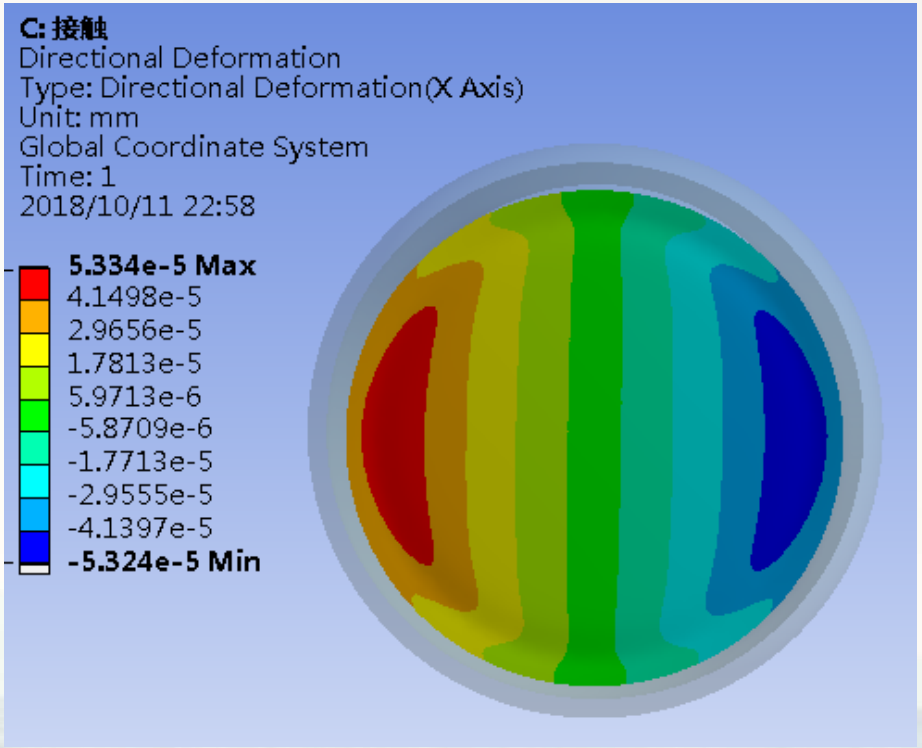
Definition	
Type	Cartesian
Coordinate System	Program Controlled
APDL Name	
Suppressed	No
Origin	
Define By	Geometry Selection
Geometry	Click to Change
Origin X	0. mm
Origin Y	0. mm
Origin Z	0. mm
Principal Axis	
Axis	X
Define By	Global X Axis
Orientation About Principal Axis	
Axis	Y
Define By	Default
Directional Vectors	
Transformations	
Base Configuration	Absolute
Transformed Configuration	[0. 0. 0.]

Details of "Hydrostatic Pressure"

Scope		
Scoping Method	Geometry Selection	
Geometry	Apply	Cancel
Definition		
Type	Hydrostatic Pressure	
Coordinate System	Global Coordinate System	
Fluid Density	0. kg/mm³	
Suppressed	No	
Hydrostatic Acceleration		
Define By	Vector	
Magnitude	0. mm/s² (ramped)	
Direction	Click to Define	
Free Surface Location		
X Coordinate	0. mm	
Y Coordinate	0. mm	
Z Coordinate	0. mm	
Location	Click to Change	

全约束边界条件的滥用


A: 全约束
Directional Deformation
Type: Directional Deformation(X Axis)
Unit: mm
Global Coordinate System
Time: 1
2018/10/11 22:57
0 Max
0 Min


C: 接触
Directional Deformation
Type: Directional Deformation(X Axis)
Unit: mm
Global Coordinate System
Time: 1
2018/10/11 22:58
5.334e-5 Max
4.1498e-5
2.9656e-5
1.7813e-5
5.9713e-6
-5.8709e-6
-1.7713e-5
-2.9555e-5
-4.1397e-5
-5.324e-5 Min

感谢大家对本视频的关注，ANSYS圈内大神众多，我也只是抛砖引玉，为创造一个更加良好宽松的有限元分析学习环境尽一己的精力！再次谢谢大家对视频的期待、关注和分享！

下一期视频，我将和大家一起交流关于《对称问题-水杯》