

# ANSYS WORKBENCH分析应用基础

## LESSON01 零件分析基本思路讲解



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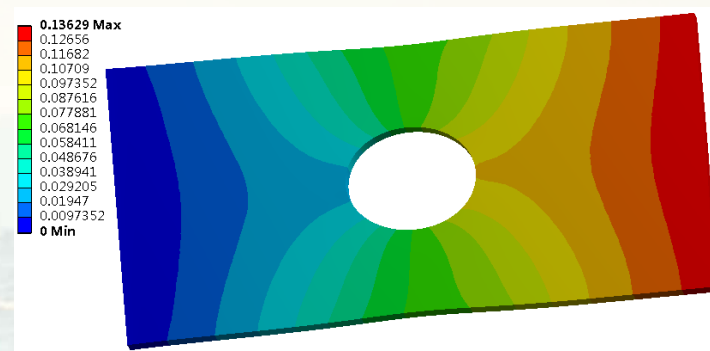
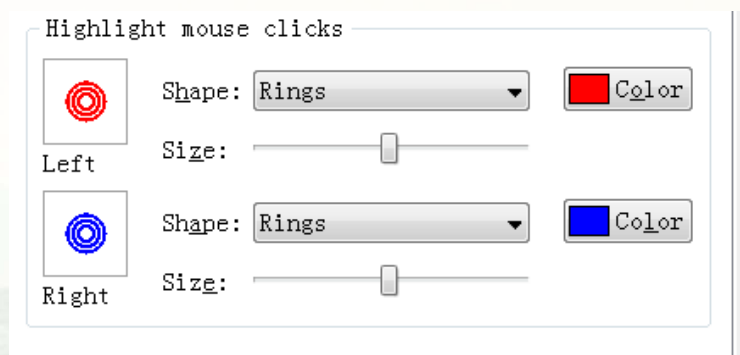
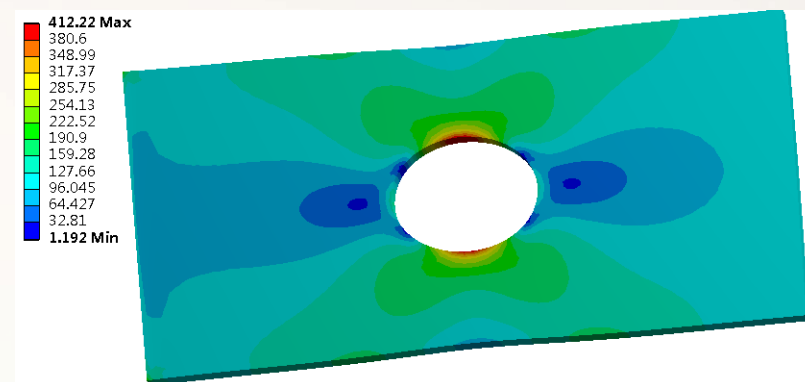
课程制作 张 晔

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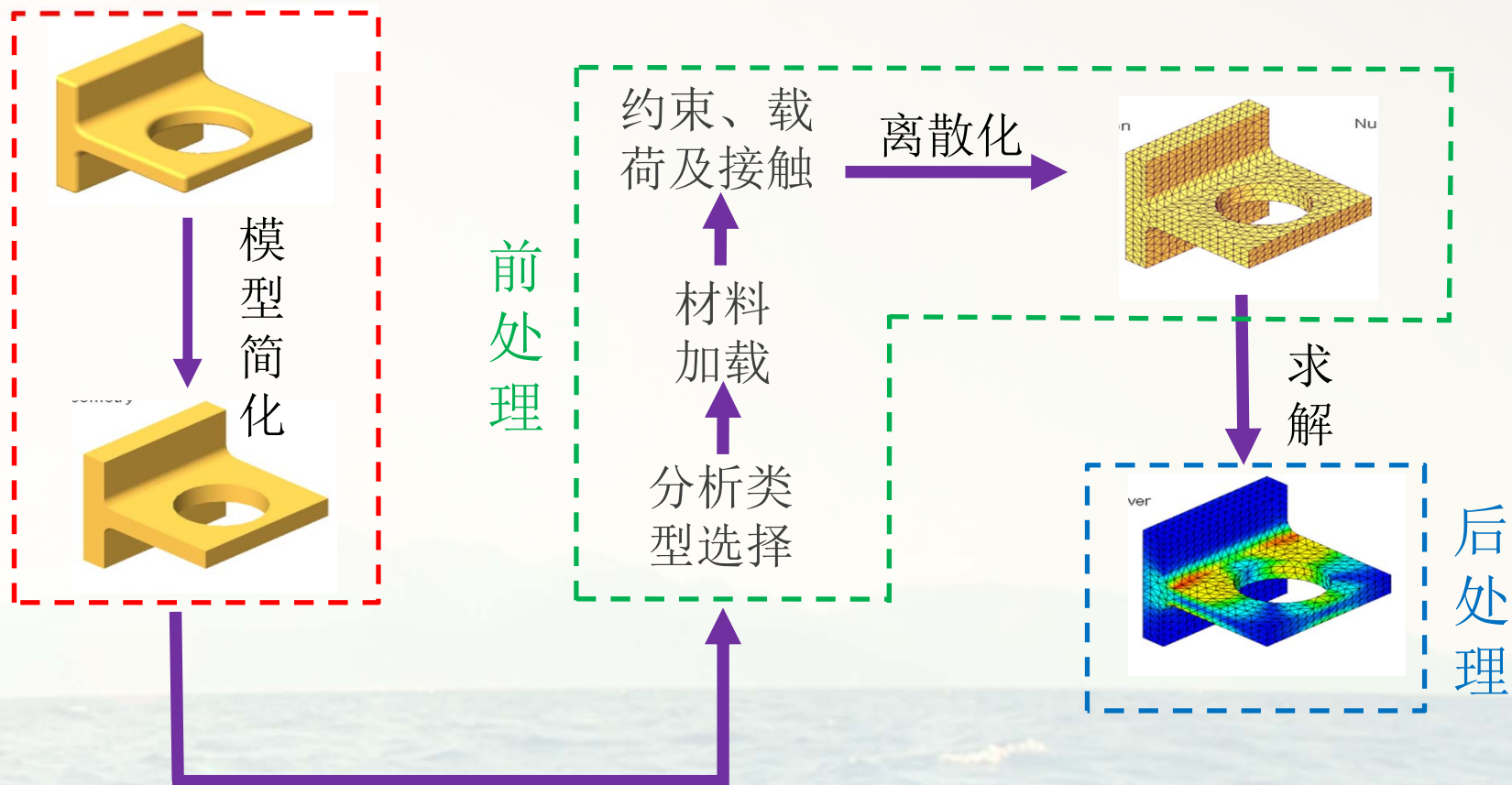
机械人读书笔记

## 本课重点内容

1. 了解操作界面
2. 通过操作了解有限元分析基本流程
3. 后处理功能介绍：缩放和云图色彩设置



# 分析操作流程



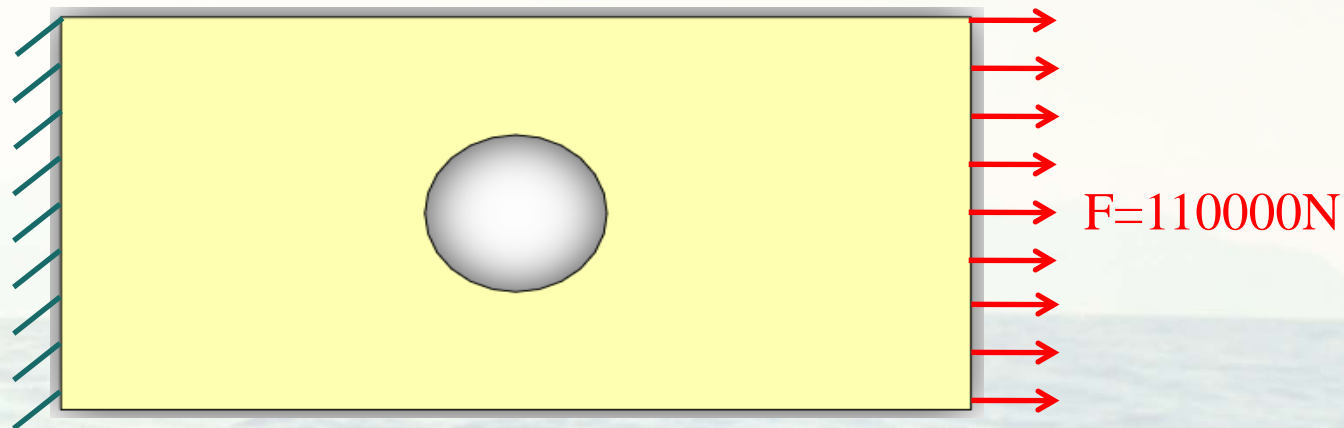
CAD模型转化为CAE模型

分析实例：带孔矩形板

问题描述：带孔矩形板一侧面均布110000N载荷，另一侧固定，利用WORKBENCH求解矩形板的应力、应变和位移，并对分析结果进行解释。

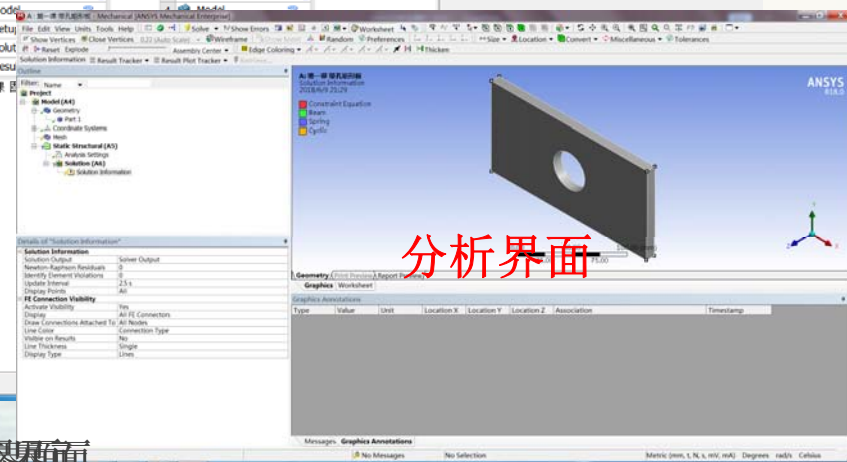
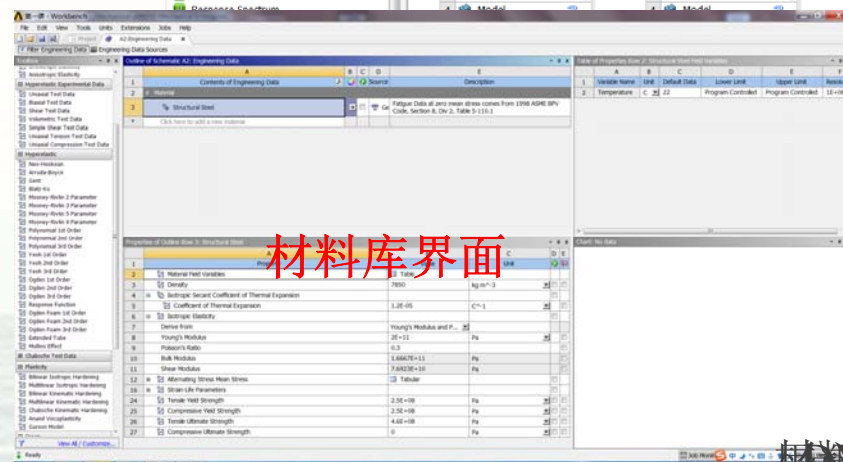
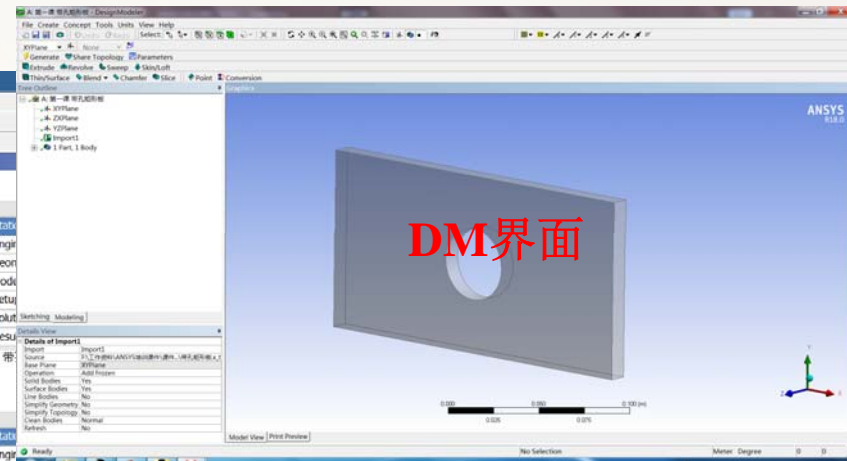
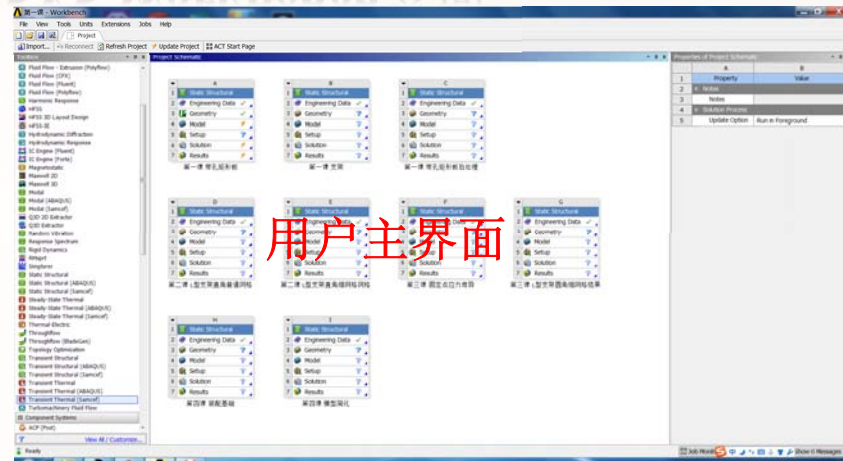
材 料： Structure Steel

屈服强度： 250MPa



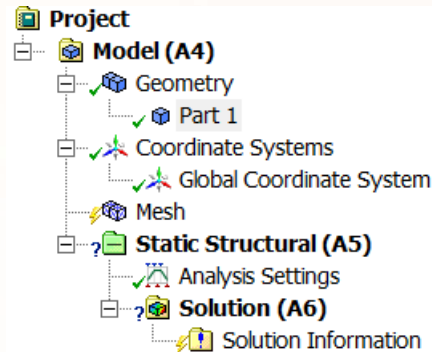


# ANSYS Workbench界面



材料库界面

# 分析流程



Details of "Part 1"	
+ Graphics Properties	
+ Definition	
<input type="checkbox"/> Suppressed	No
Stiffness Behavior	Flexible
Coordinate System	Default Coordinate System
Reference Temperature	By Environment
Behavior	None
+ Material	
Assignment	Structural Steel
Nonlinear Effects	Yes
Thermal Strain Effects	Yes
+ Bounding Box	
+ Properties	
+ Statistics	

Details of "Mesh"	
+ Display	
Display Style	Body Color
+ Defaults	
Physics Preference	Mechanical
<input type="checkbox"/> Relevance	0
Element Midside Nodes	Program Controlled
+ Sizing	
Size Function	Adaptive
Relevance Center	Coarse
<input type="checkbox"/> Element Size	Default
Initial Size Seed	Active Assembly
Transition	Fast
Span Angle Center	Coarse
Automatic Mesh Based...	On
<input type="checkbox"/> Defeature Size	Default
Minimum Edge Length	10.0 mm
+ Quality	
+ Inflation	
+ Advanced	
+ Statistics	

Details of "Analysis Settings"	
+ Step Controls	
Number Of Steps	1.
Current Step Number	1.
Step End Time	1. s
Auto Time Stepping	Program Controlled
+ Solver Controls	
Solver Type	Program Controlled
Weak Springs	Off
Solver Pivot Checking	Program Controlled
Large Deflection	Off
Inertia Relief	Off
+ Rotordynamics Controls	
+ Restart Controls	
+ Nonlinear Controls	
+ Output Controls	
+ Analysis Data Management	

Supports	Conditions
+ Fixed Support	
+ Displacement	
+ Remote Displacement	
+ Velocity	
+ Impedance Boundary	
+ Frictionless Support	
+ Compression Only Support	
+ Cylindrical Support	
+ Simply Supported	
+ Fixed Rotation	
+ Elastic Support	

Loads	Supports	Conditions
+ Pressure		
+ Pipe Pressure		
+ Hydrostatic Pressure		
+ Force		
+ Remote Force		
+ Bearing Load		
+ Bolt Pretension		
+ Moment		
+ Generalized Plane Strain		
+ Line Pressure		
+ Thermal Condition		
+ Pipe Temperature		
+ Joint Load		
+ Fluid Solid Interface		
+ Detonation Point		
+ Rotating Force		

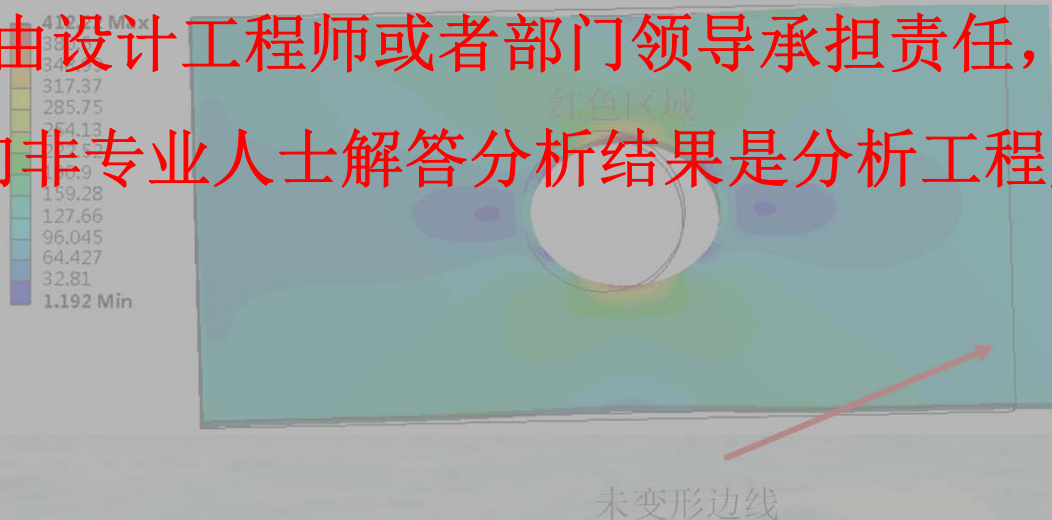
## 后处理显示技巧

我们在实际应用中经常遇到的问题是当分析工程师将分析结果提交给领导或者设计部的时候，会被非专业人士两个问题搞得焦头烂额：

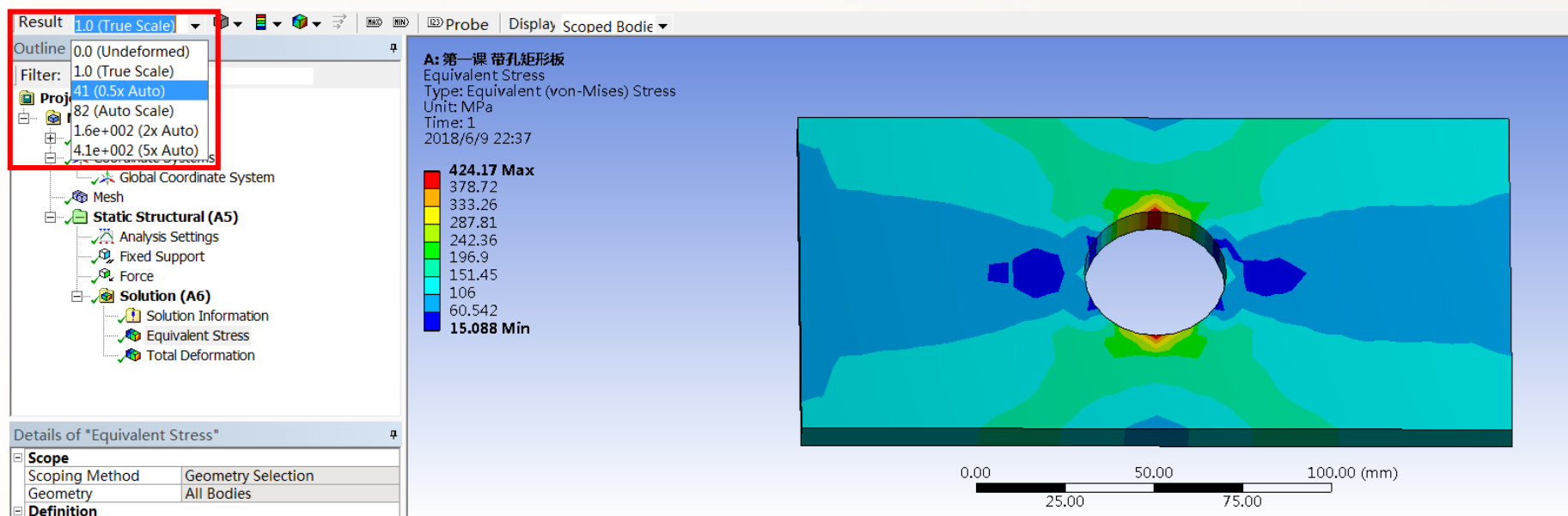
1. 红色区域=危险区域；

2. 变形为何这么大？

目前，多数企业的分析结果不是由分析工程师承担责任，而是由设计工程师或者部门领导承担责任，因此，有效地向非专业人士解答分析结果是分析工程师的职责！



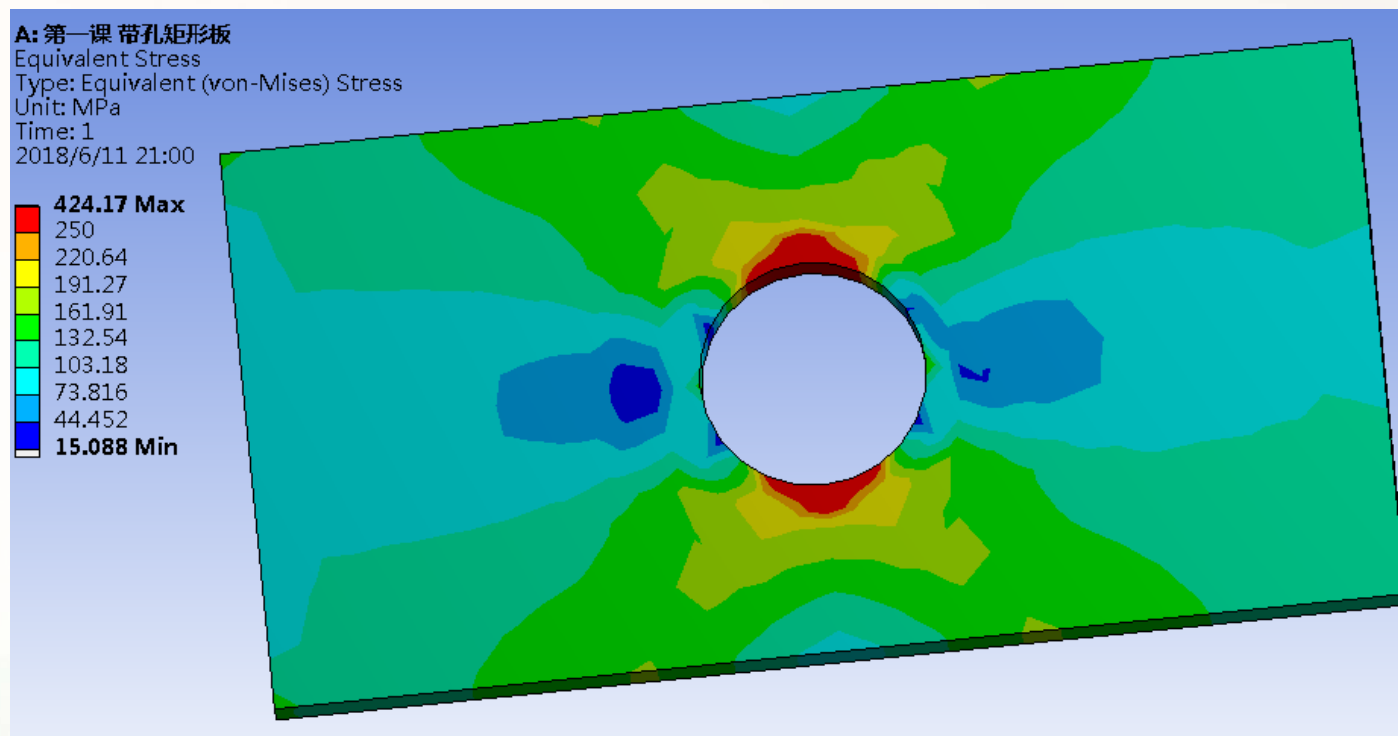
## 后处理显示技巧——变形比例缩放



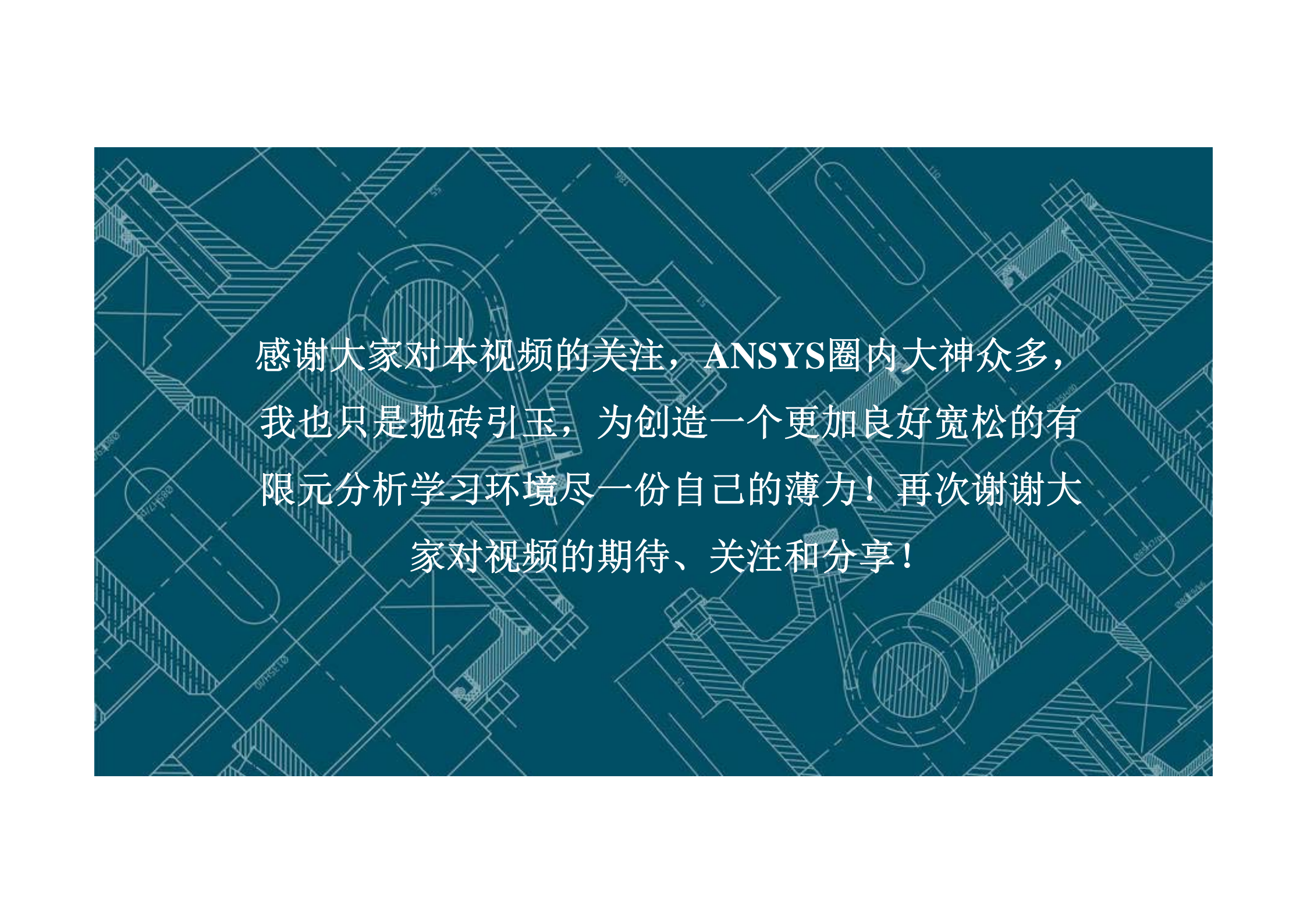
比例显示的重要性



## 后处理显示技巧——红色和危险点关系



很多对分析不了解的人以颜色区分结构危险点，认为出现红色就是不合格，如何解释该问题？

The background of the slide is a dark teal color with a complex, light-colored technical drawing or blueprint pattern. The pattern consists of various geometric shapes, lines, and hatching, typical of engineering drawings, overlaid on a grid-like structure.

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份自己的薄力！再次谢谢大  
家对视频的期待、关注和分享！