

Element Selection in Abaqus

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Day 1

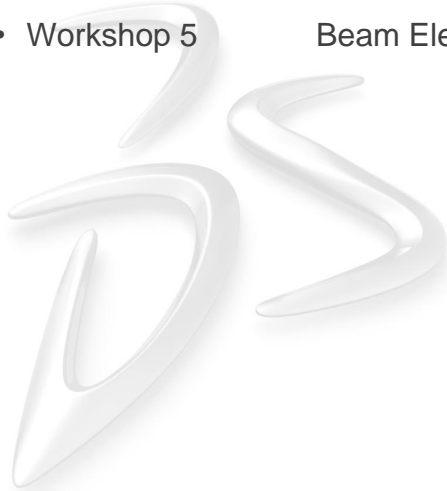
- **Lecture 1** **Solid Elements in Abaqus**
- **Lecture 2** **Cylindrical and Infinite Elements**
- **Lecture 3** **Solid Element Integration, Hourglassing, and Incompressible Material Behavior**
 - Demo 1 Hourglass control
 - Workshop 1 Plane Strain Elements
- **Lecture 4** **Key Properties of Solid Elements**
- **Lecture 5** **Modeling Bending and Stress Concentrations with Solid Elements**
 - Workshop 2 Plane Stress Elements
 - Workshop 3 3-D Solid Elements

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Day 2

- **Lecture 6** **Structural Elements in Abaqus**
- **Lecture 7** **Conventional Shell Elements**
- **Lecture 8** **Continuum Shell Elements**
 - Workshop 4 Shell Elements
- **Lecture 9** **Beam and Frame Elements**
 - Workshop 5 Beam Elements



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Revision Status

Lecture 1	5/11	Updated for 6.11
Lecture 2	5/11	Updated for 6.11
Lecture 3	5/11	Updated for 6.11
Lecture 4	5/11	Updated for 6.11
Lecture 5	5/11	Updated for 6.11
Lecture 6	5/11	Updated for 6.11
Lecture 7	5/11	Updated for 6.11
Lecture 8	5/11	Updated for 6.11
Lecture 9	5/11	Updated for 6.11
Demo 1	5/11	Updated for 6.11

Workshop 1	5/11	Updated for 6.11
Answers 1	5/11	Updated for 6.11
Workshop 2	5/11	Updated for 6.11
Answers 2	5/11	Updated for 6.11
Workshop 3	5/11	Updated for 6.11
Answers 3	5/11	Updated for 6.11
Workshop 4	5/11	Updated for 6.11
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Workshop 5	5/11	Updated for 6.11
Answers 5	5/11	Updated for 6.11

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Element Selection in Abaqus



Solid Elements in Abaqus

Lecture 1

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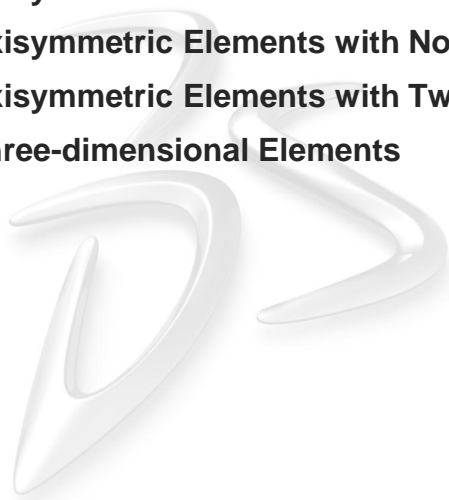
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L1.2

Overview

- Introduction
- Solid Elements in Abaqus
- Planar Elements
- Generalized Plane Strain Elements ^(S)
- Axisymmetric Elements
- Axisymmetric Elements with Nonaxisymmetric Response ^(S)
- Axisymmetric Elements with Twist ^(S)
- Three-dimensional Elements

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Solid Elements Continued: Cylindrical and Infinite Elements

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L2.2

Overview

- Cylindrical Elements ^(S)
- Infinite Elements

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Element Selection in Abaqus

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Solid Element Integration, Hourglassing, and Incompressible Material Behavior

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Overview

- Numerical Integration
- Hourglassing and Hourglass Control
- Incompressible Material Behavior
- The \bar{B} Approach
- Hybrid (Mixed) Elements ^(S)
- Demonstration

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Key Properties of Solid Elements

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Overview

- Key Properties of First-Order Triangles and Tetrahedra
- Key Properties of Fully Integrated First-Order Quads and Bricks
- Key Properties of Reduced-Integration First-Order Quads and Bricks
- Key Properties of Second-Order Triangles and Tetrahedra
- Key Properties of Fully Integrated Second-Order Quads and Bricks ^(S)
- Key Properties of Reduced-Integration Second-Order Quads and Bricks ^(S)
- Using Second-Order Bricks in Contact Problems ^(S)
- Quads/Bricks or Triangles/Tetrahedra?
- First- or Second-Order Elements?

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Modeling Bending and Stress Concentrations with Solid Elements

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Overview

- Bending Problems and Shear Locking
- Incompatible Mode Elements
- **Summary: Modeling Bending Using Continuum Elements**
- Stress Concentrations
- Second-order Accuracy ^(E)
- Solid Element Selection Summary
- Abaqus/Standard vs. Abaqus/Explicit
- Continuum vs. Structural Elements

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Structural Elements in Abaqus

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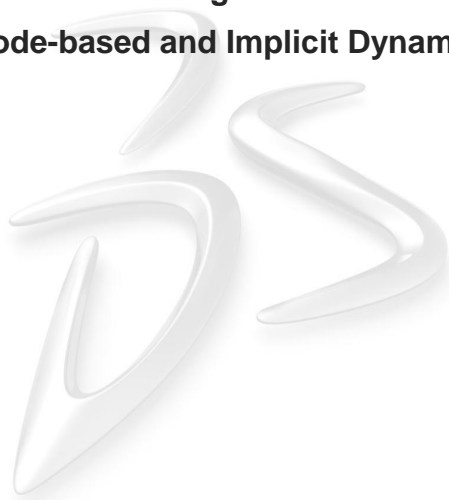
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L6.2

Overview

- Introduction
- Structural Elements in Abaqus
- Classical Formulation of Thin Shells and Slender Beams ^(S)
- Shear Flexible Formulation of Shells and Beams
- Thickness Changes
- Mode-based and Implicit Dynamics ^(S)

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Conventional Shell Elements

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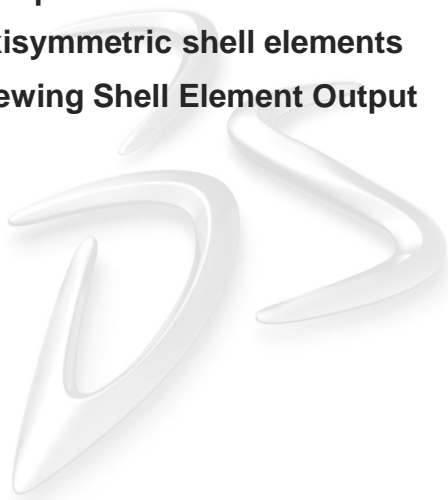
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L7.2

Overview

- **Conventional vs. Continuum Shell Elements**
- **Defining Conventional Shells**
- **Conventional Shell Element Behavior**
- **Conventional shell Element Types**
- **Comparison Studies**
- **Axisymmetric shell elements**
- **Viewing Shell Element Output**

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Continuum Shell Elements

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Overview

- Introduction to Continuum Shell Elements
- Continuum Shell Modeling
- Continuum Shell Example
- Shell Element Selection Summary
- Abaqus/CAE Demonstration: Controlling the Mesh Stack Direction

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Beam and Frame Elements

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L9.2

Overview

- **Beam Elements**
- **Defining Beam Elements**
- **Viewing Beam Element Output**
- **Meshed Beam Cross Sections ^(S)**
- **Beam Element Selection Summary**
- **Frame Elements ^(S)**

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