ANSYS Composite PrepPost 19.0
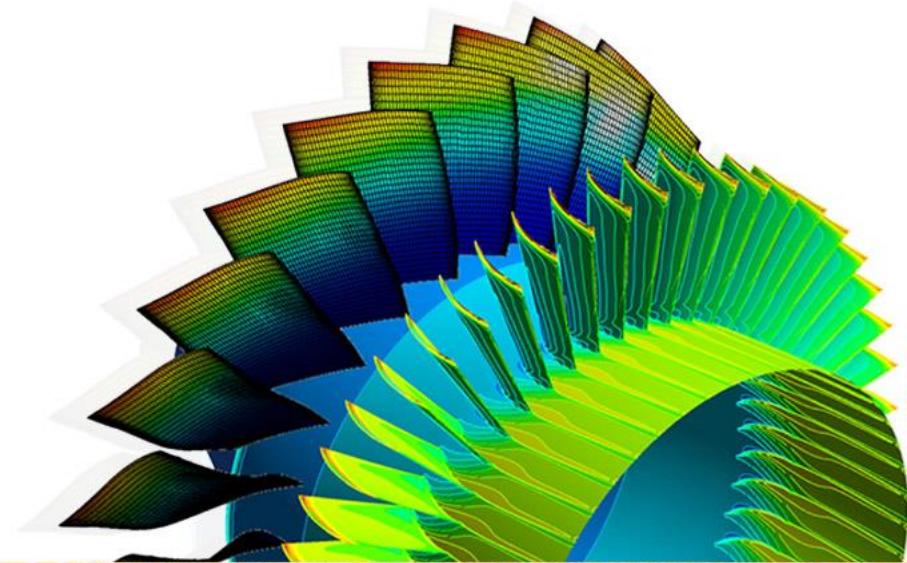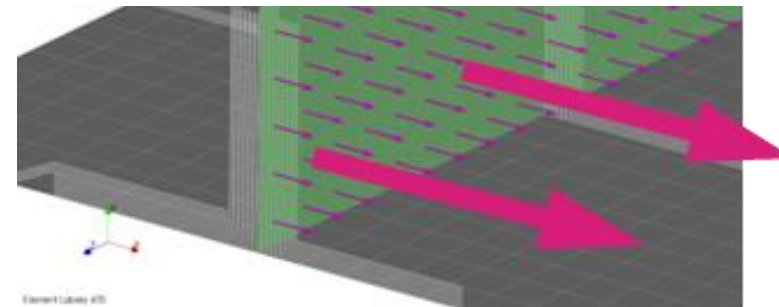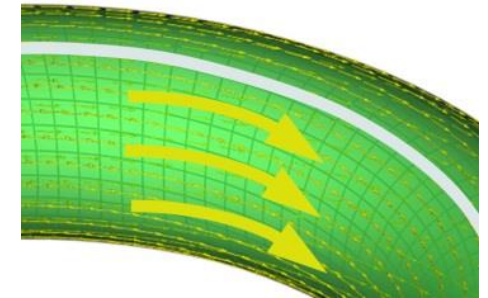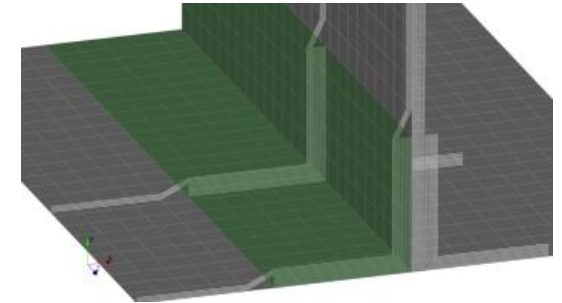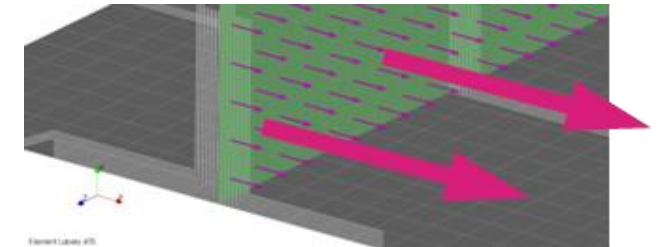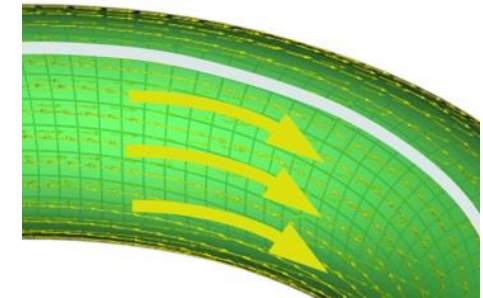
Module 4: Rosettes and Oriented Selection Sets
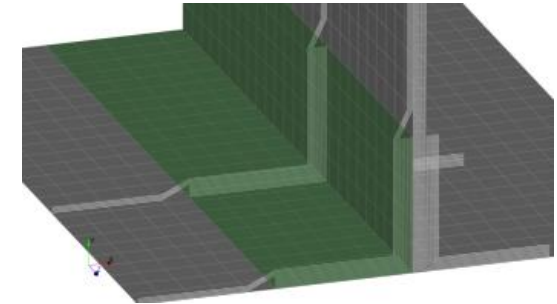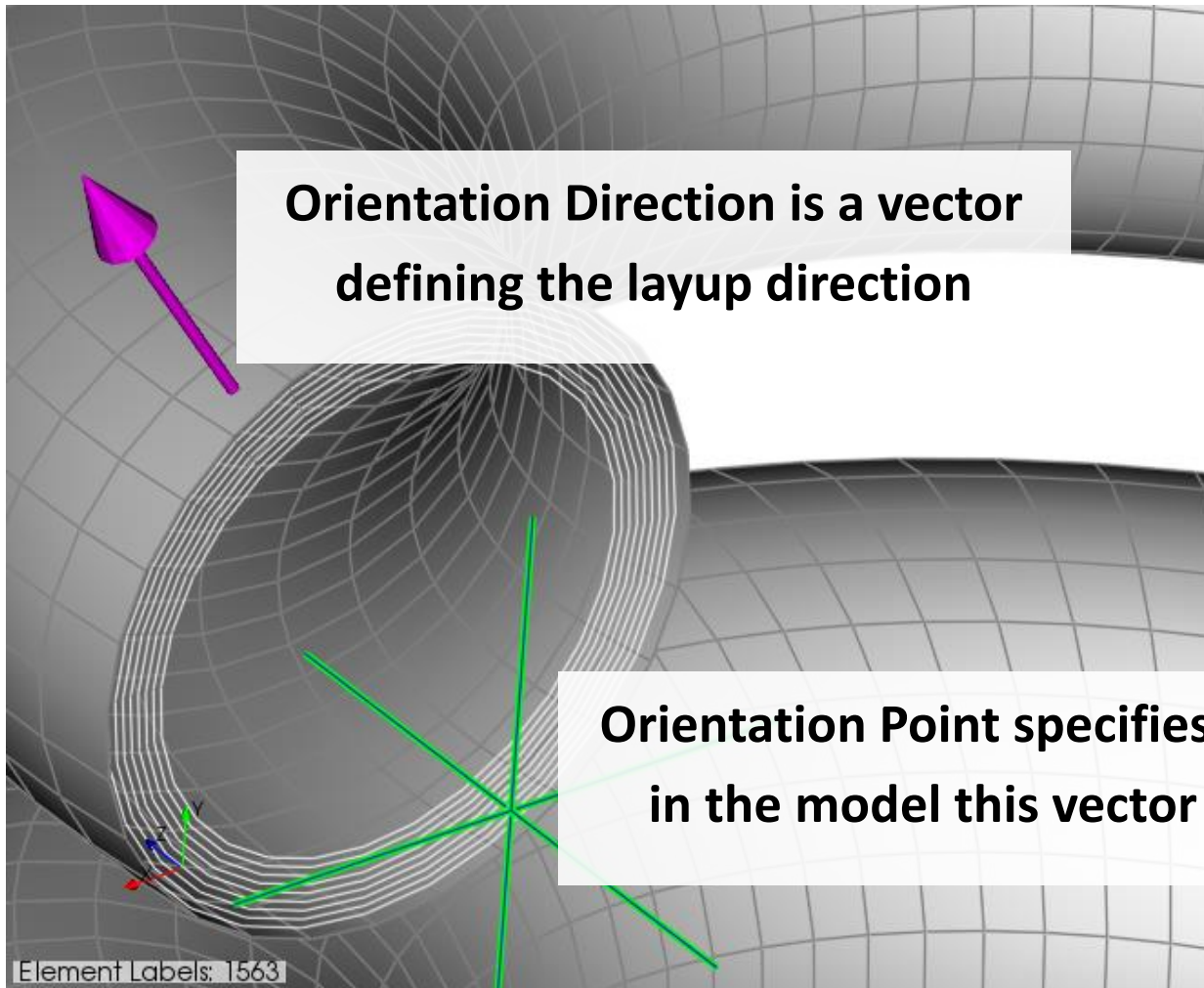
4 Rosettes and Oriented Selection Sets

- Oriented Selection Sets define the basis for the layup definition. They contain the following important details for a composite layup

  - The area which is later used to apply layers on

  - The direction defining the 0° fiber direction. All defined angles are based on this direction

  - The direction in which layers are applied

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4 Rosettes and Oriented Selection Sets

- Orientation Point and Orientation Directions

Orientation Direction is a vector defining the layup direction

Orientation Point specifies the location in the model this vector belongs to
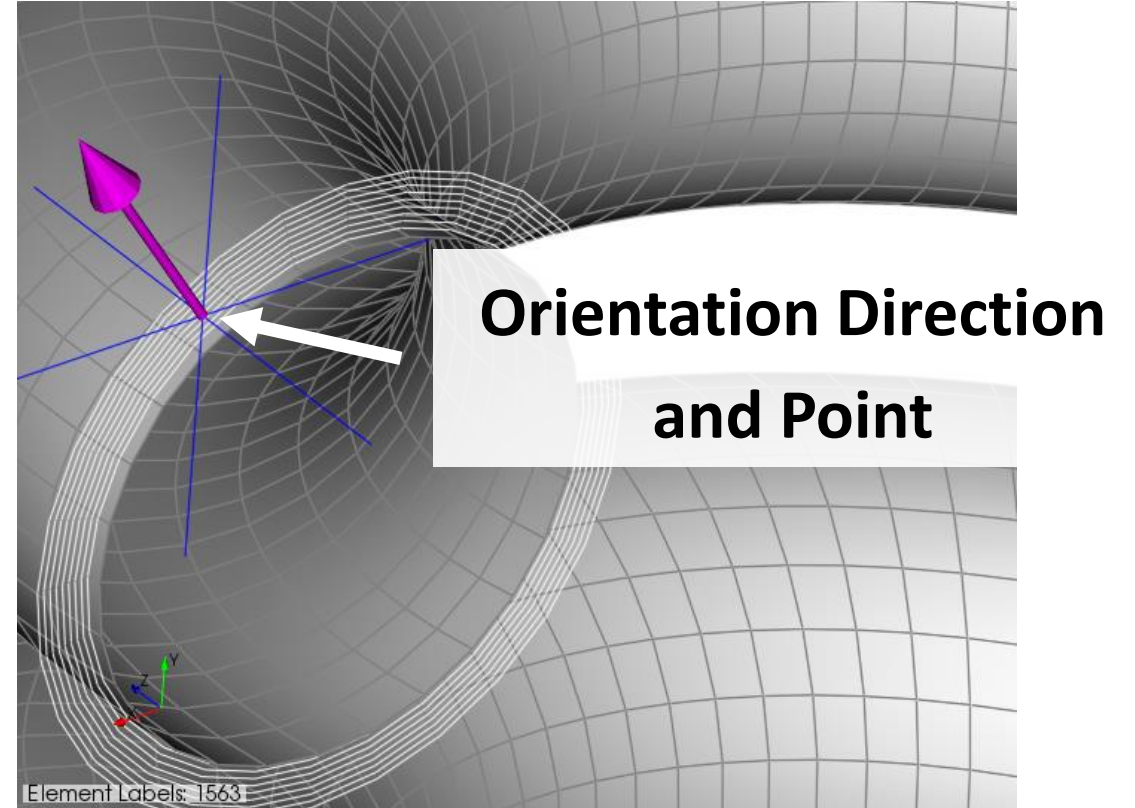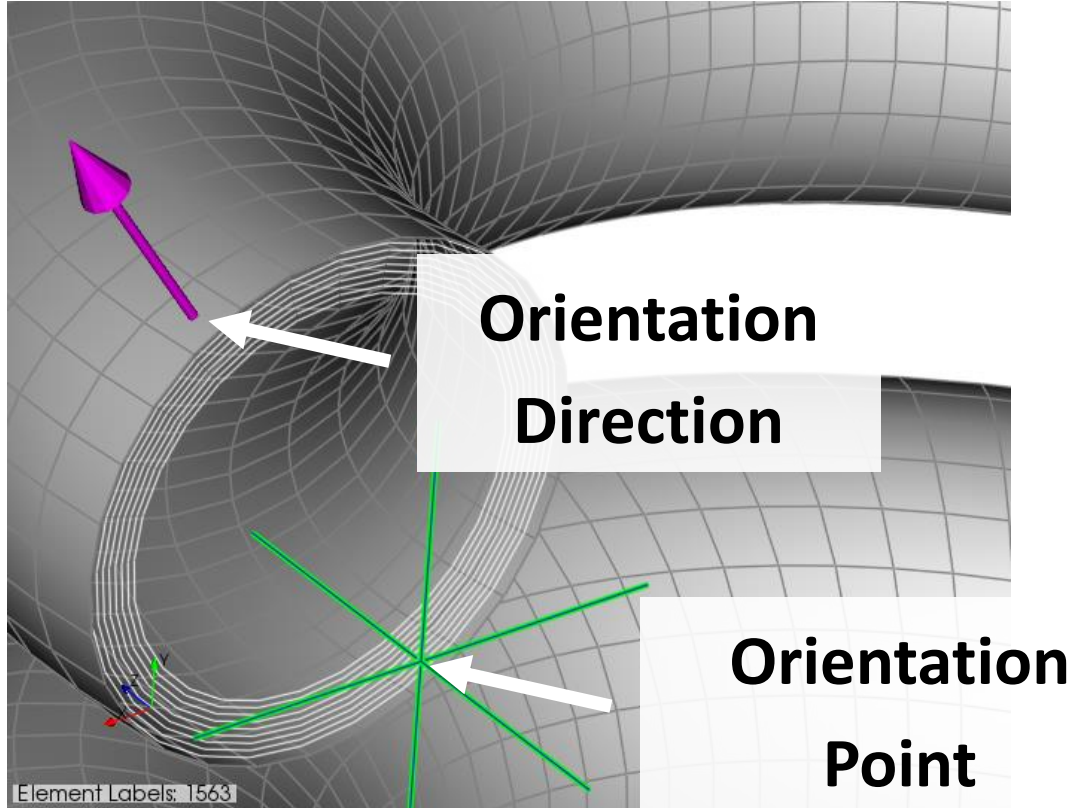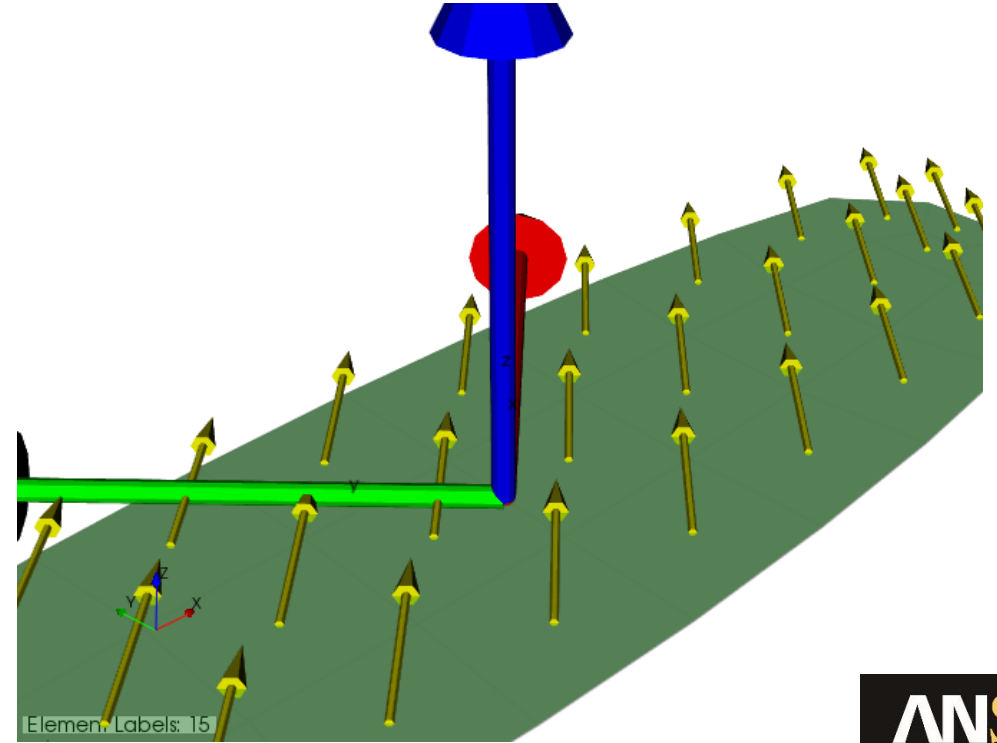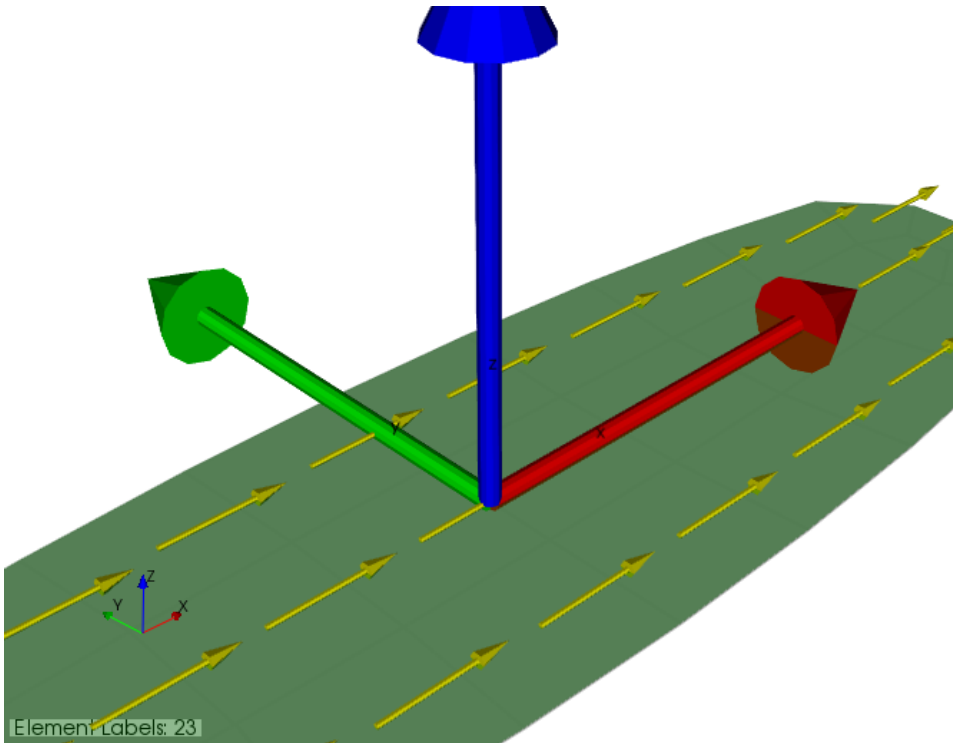
Element Labels: 1563

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4 Rosettes and Oriented Selection Sets

- Orientation Point and Orientation Directions
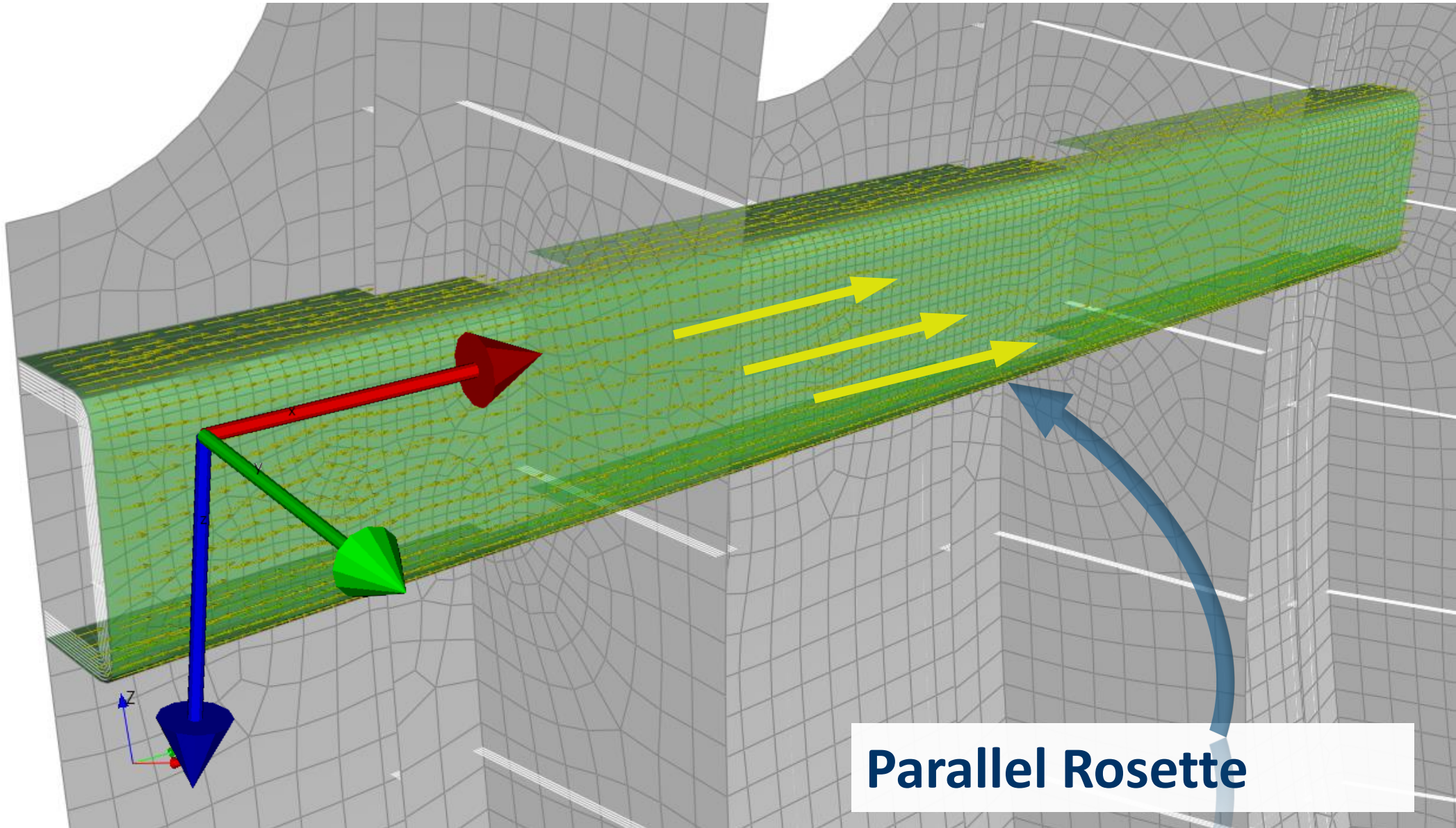
4 Rosettes and Oriented Selection Sets

- Rosettes are used to define

  reference directions (0° Fiber direction)

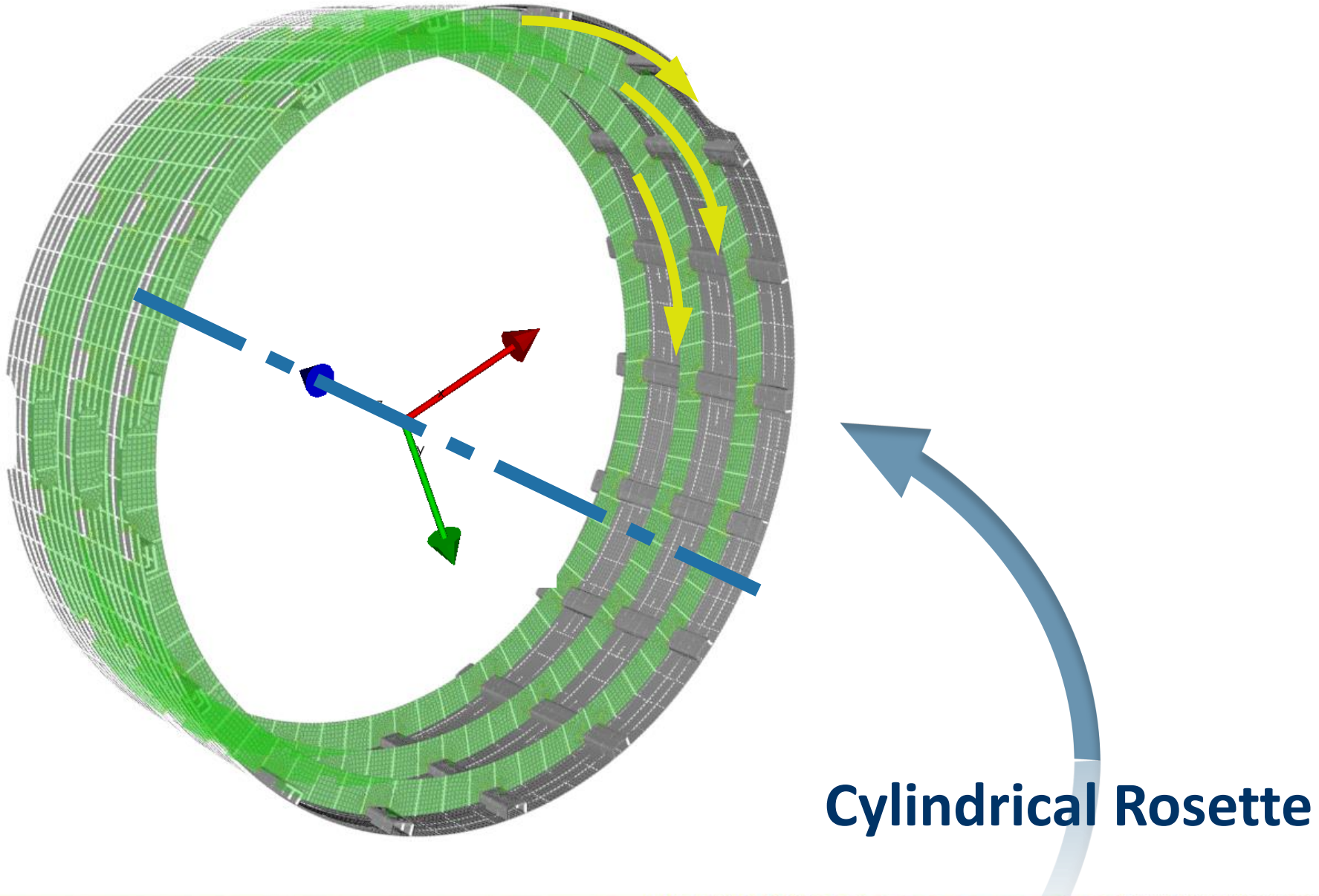- The x-axis of a rosette defines the reference direction

4 Rosettes and Oriented Selection Sets

- Different rosettes are available to define the reference direction (0° fiber direction). All rosettes are shown on the next slides.
  - Parallel Rosette
  - Cylindrical Rosette
  - Radial Rosette
  - Spherical Rosette
  - Edge Wise Rosette (fiber reference direction following an edge of the model)
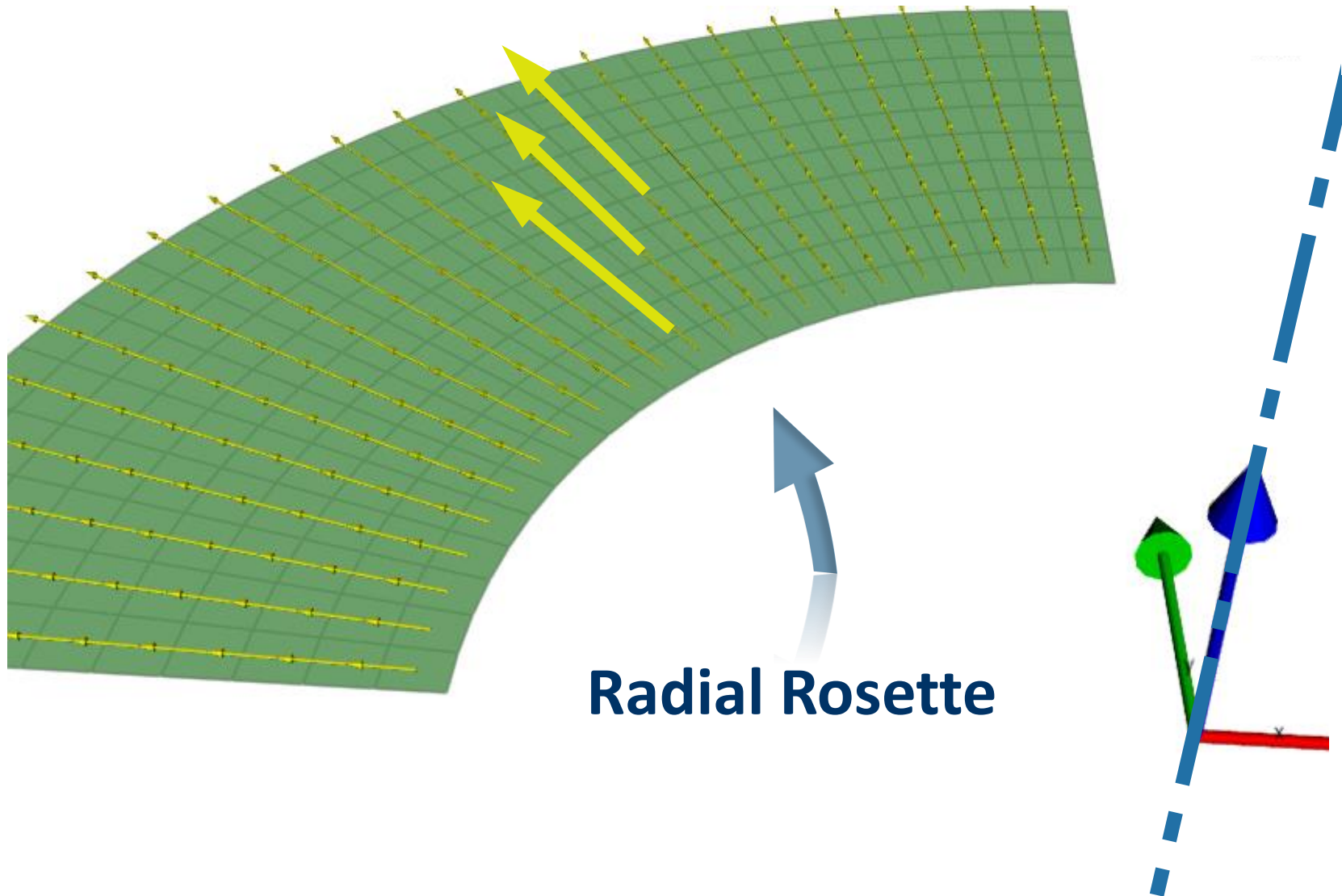
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4 Rosettes and Oriented Selection Sets
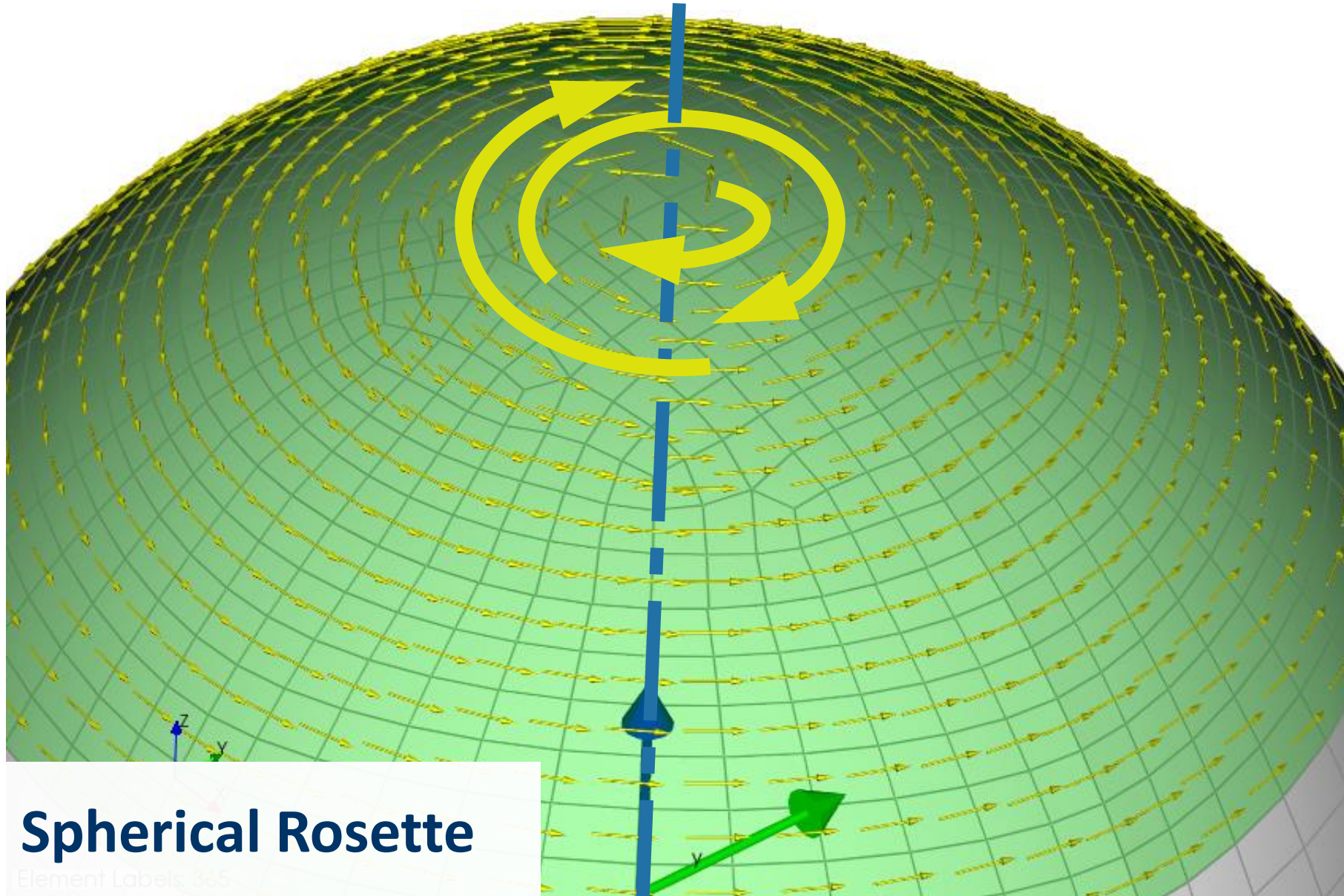

Parallel Rosette

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4 Rosettes and Oriented Selection Sets

Cylindrical Rosette

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4 Rosettes and Oriented Selection Sets

Radial Rosette

4 Rosettes and Oriented Selection Sets

Spherical Rosette

4 Rosettes and Oriented Selection Sets

Edge-Wise Rosette

4 Rosettes and Oriented Selection Sets

Edge-Wise Rosette

4 Rosettes and Oriented Selection Sets

- ## Selection Methods

Each element selects the rosette to define its reference direction based on the selection method.
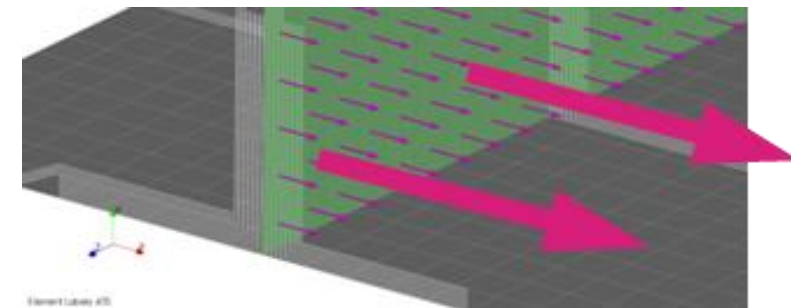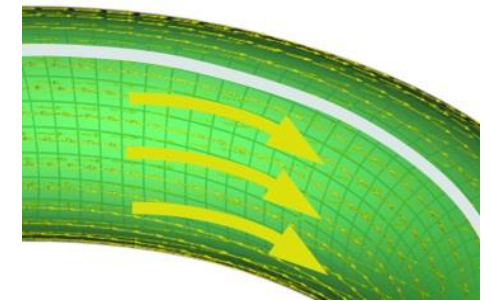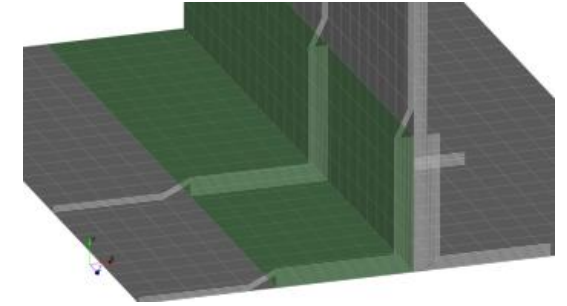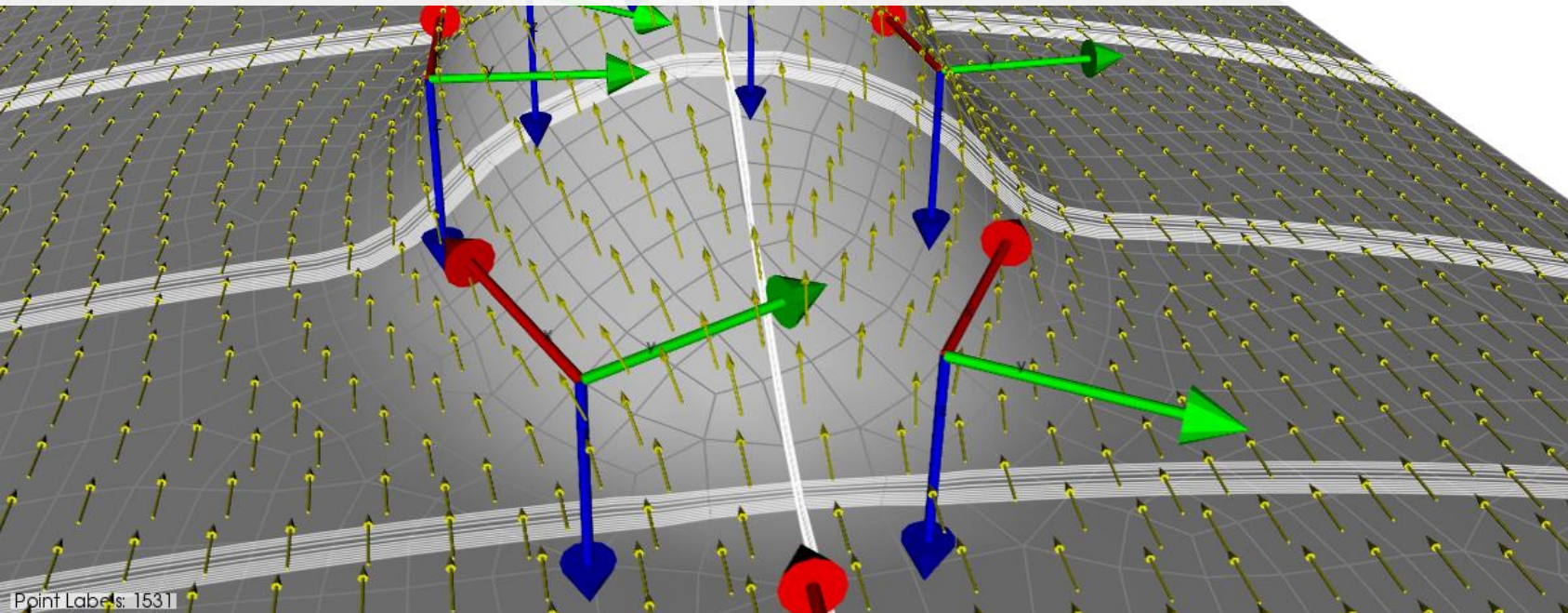
4 Rosettes and Oriented Selection Sets

- ## Selection Method Minimum Distance Superposed

Minimum Distance Superposed

4 Rosettes and Oriented Selection Sets

- Selection Method Minimum Angle

Minimum Angle

Angle

Element Labels: 222

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4 Rosettes and Oriented Selection Sets

- Selection Methods

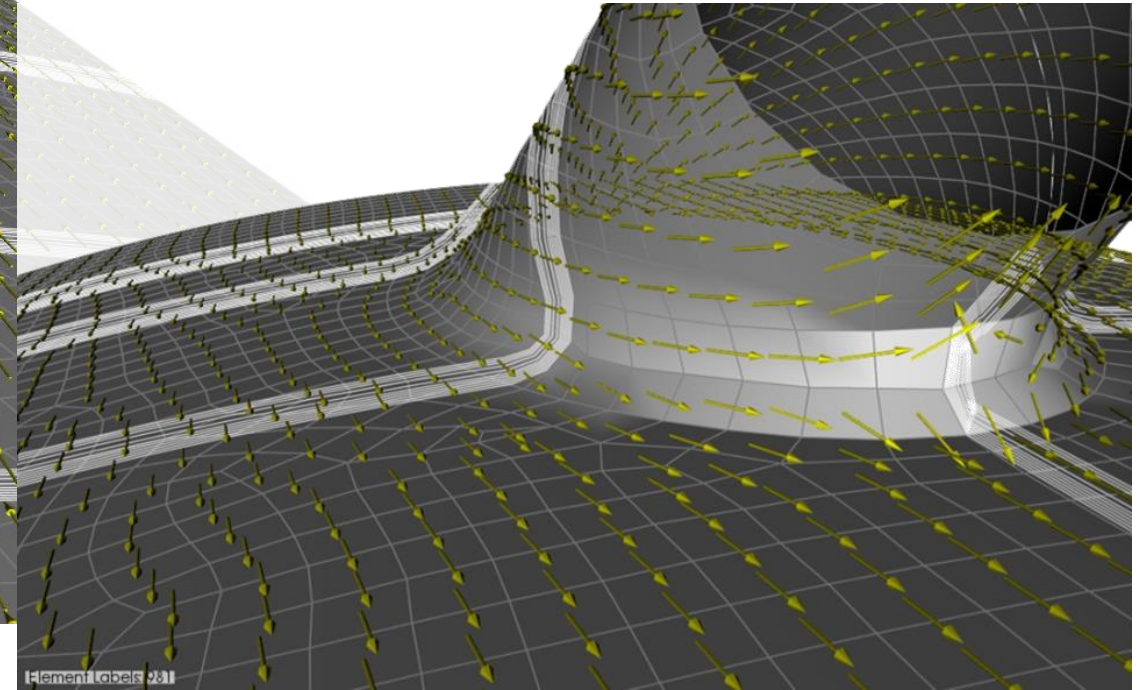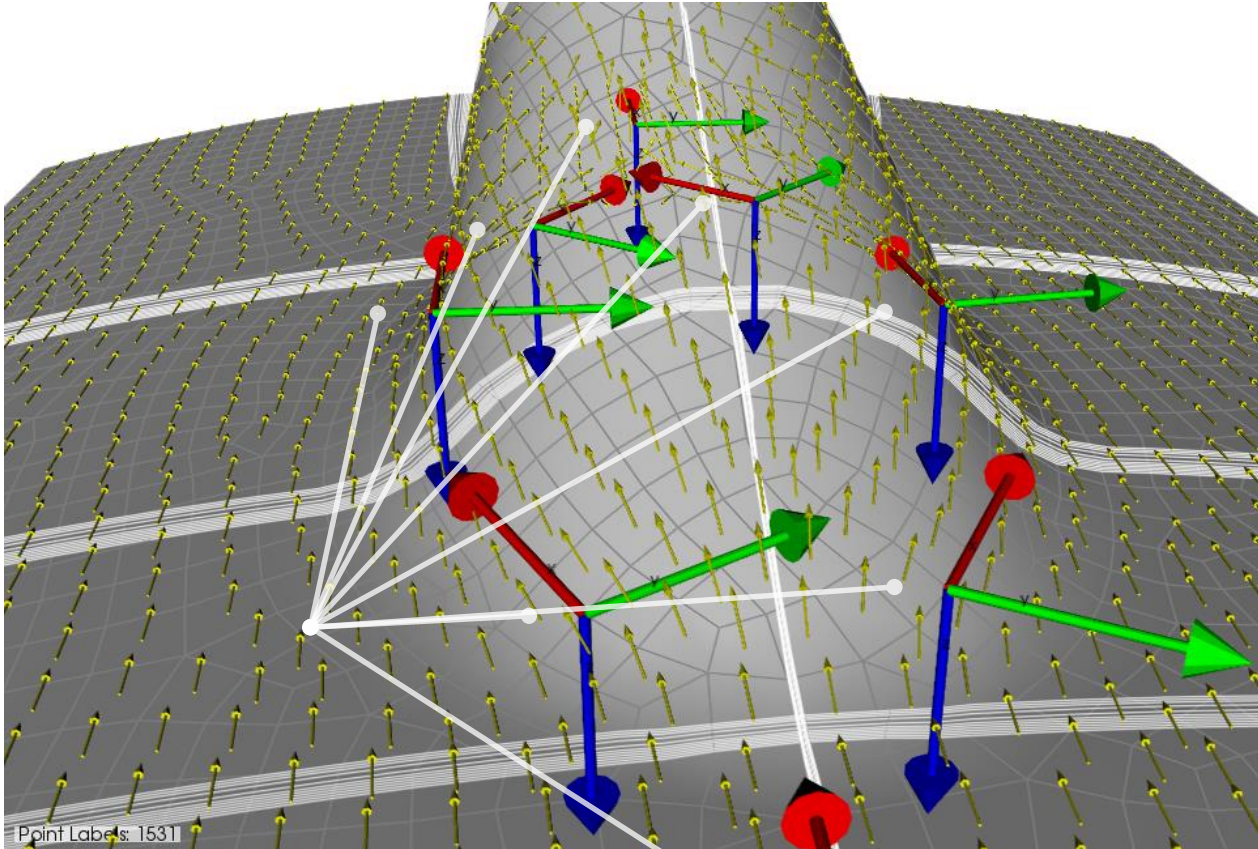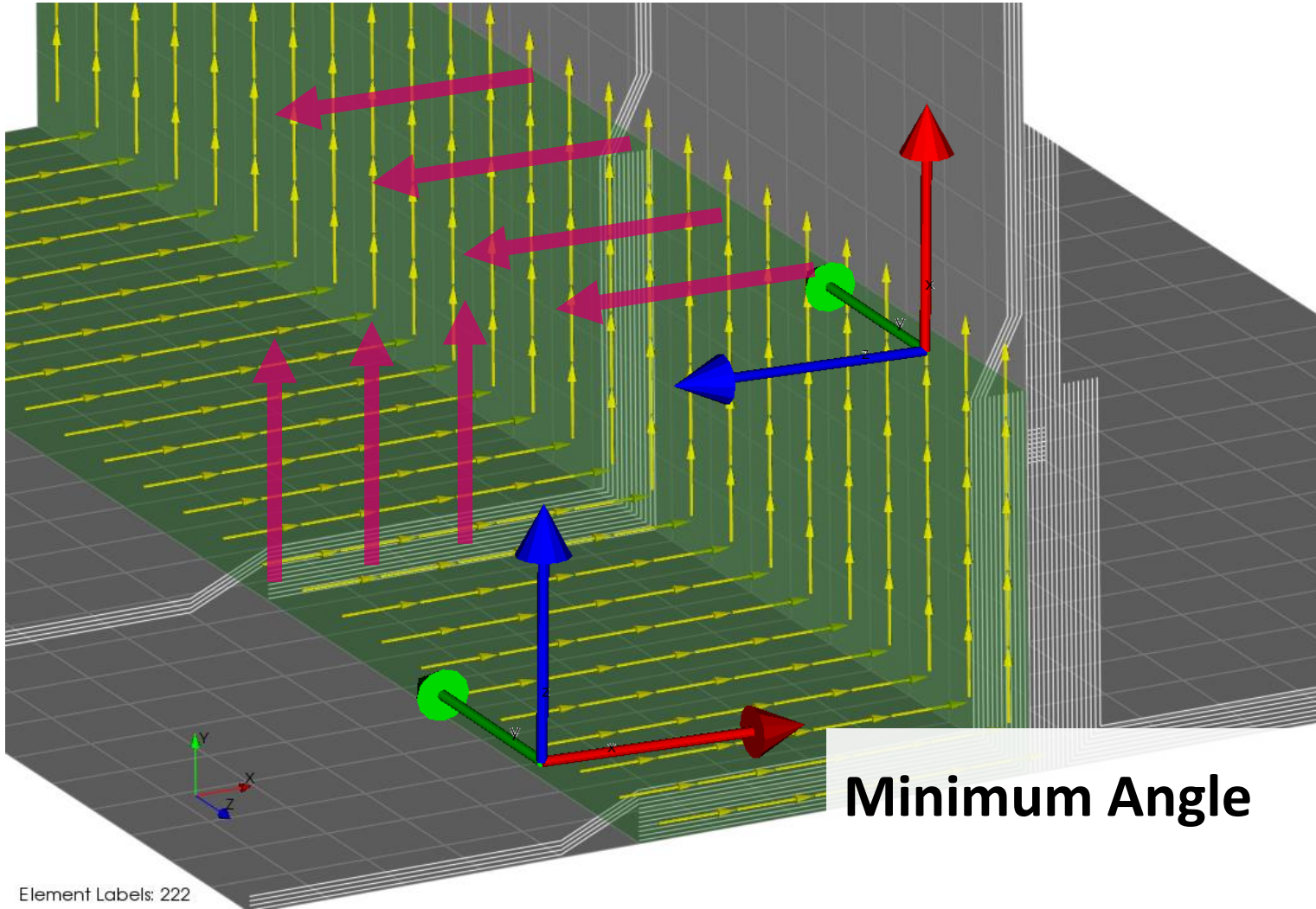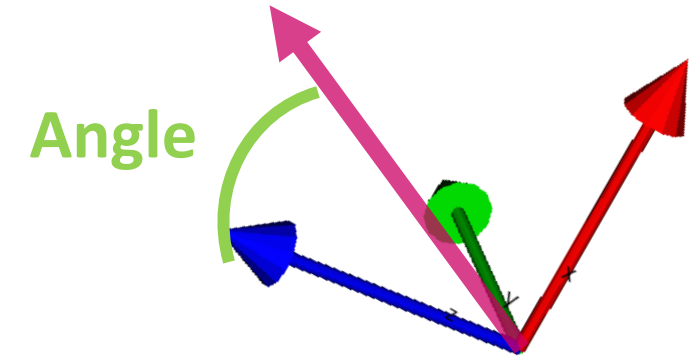 - ANSYS Classic: The coordinate system is projected on the elements as defined in APDL
  - Maximum Angle: The rosette, from the ones selected, from which z-direction has the maximum angle to the element orientation is selected to define the reference direction
  - Maximum Angle Superposed: Same as Maximum Angle, but all selected coordinate systems are considered and weighted
  - Minimum Angle: Same as Maximum Angle but using the minimum angle
  - Minimum Angle Superposed: Same as Minimum Angle but all selected coordinate systems are considered and weighted

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4 Rosettes and Oriented Selection Sets

- Selection Methods

  - Minimum Distance: Uses the nearest coordinate system to the element to define the reference direction
  - Minimum Distance Superposed: Same as Minimum Distance but all selected coordinate systems are considered and weighted by the distance to the element
  - Tabular Values: The orientation is interpolated from the values of a Look-up Table. The table must include location values and a direction column.

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