Lecture 8:
Finite Elements Simulations

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# Geometry
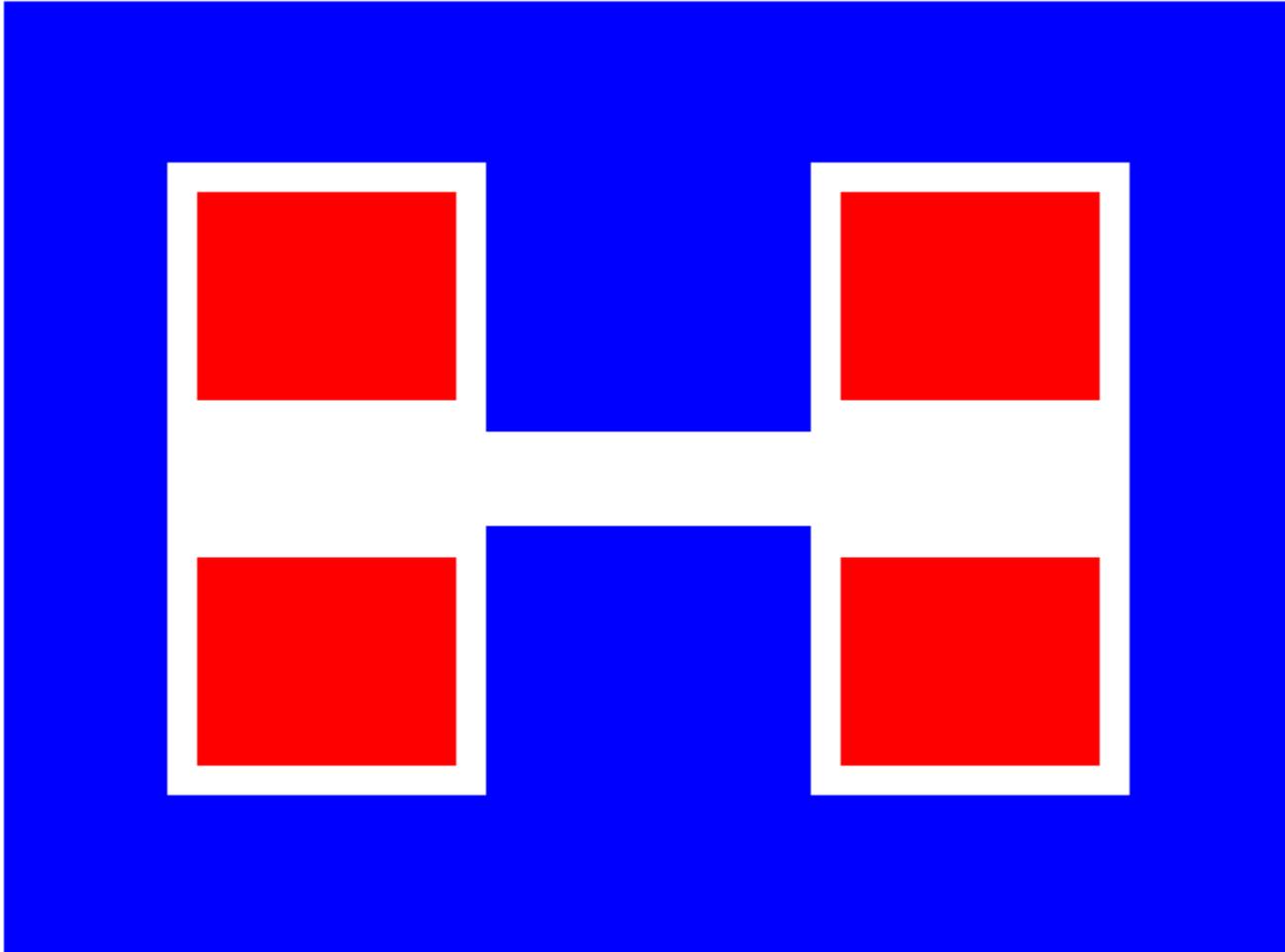
General guideline for FE models
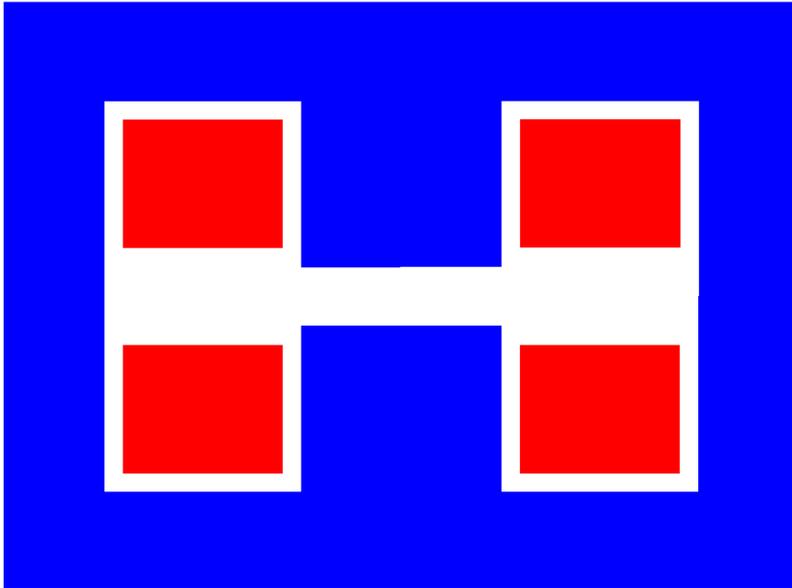
1) Reduce the model taking advantages of the symmetries

General guideline for FE models
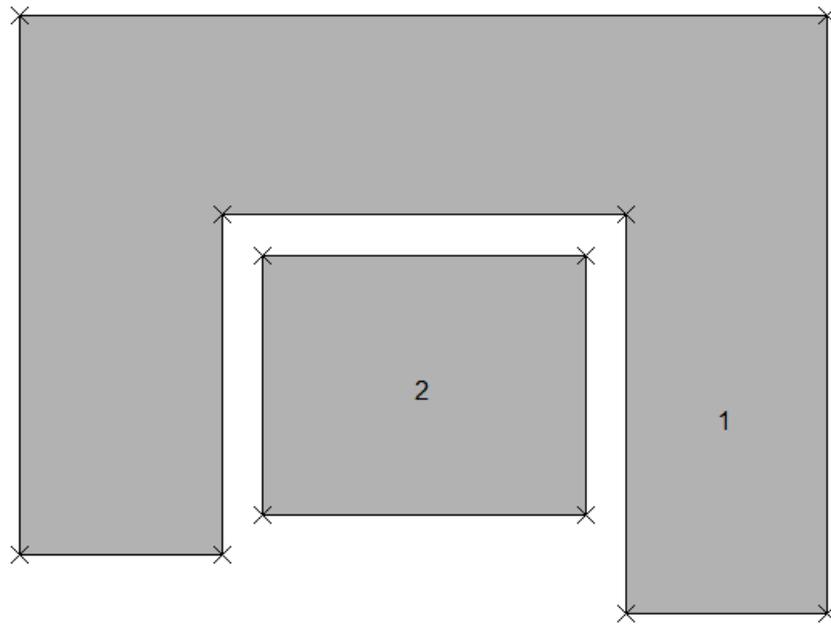
1) Reduce the model taking advantages of the symmetries

2) Define geometry regions

General guideline for FE models
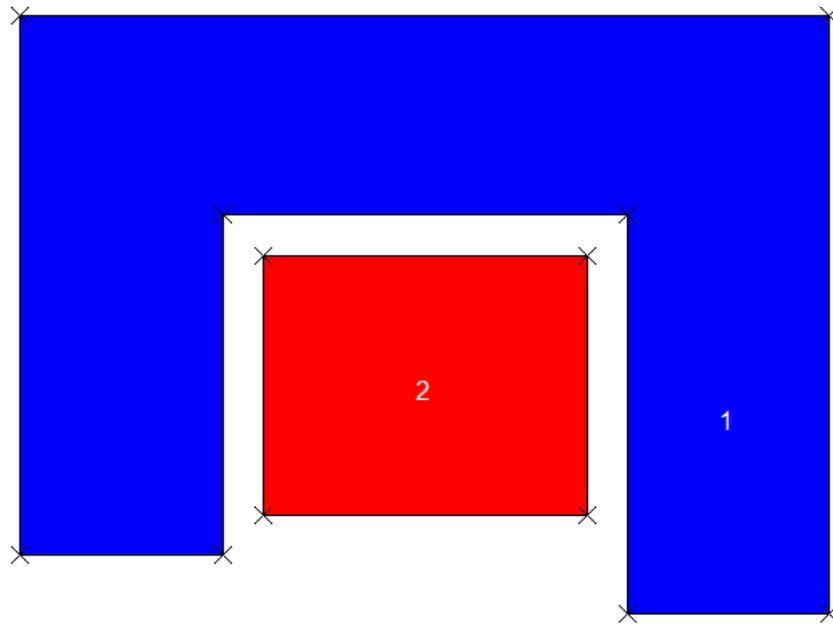
1) Reduce the model taking advantages of the symmetries

2) Define geometry regions

3) Define regions material properties

General guideline for FE models
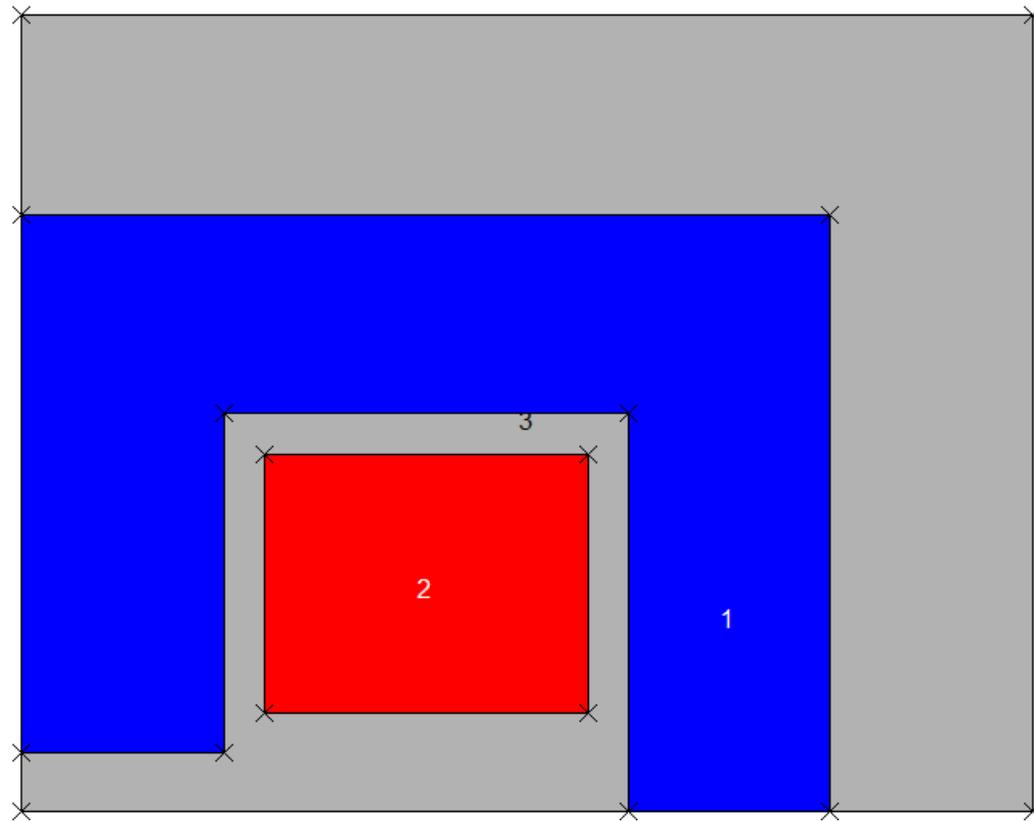
1) Reduce the model taking advantages of the symmetries

2) Define geometry regions

3) Define regions material properties

4) Define your "universe"

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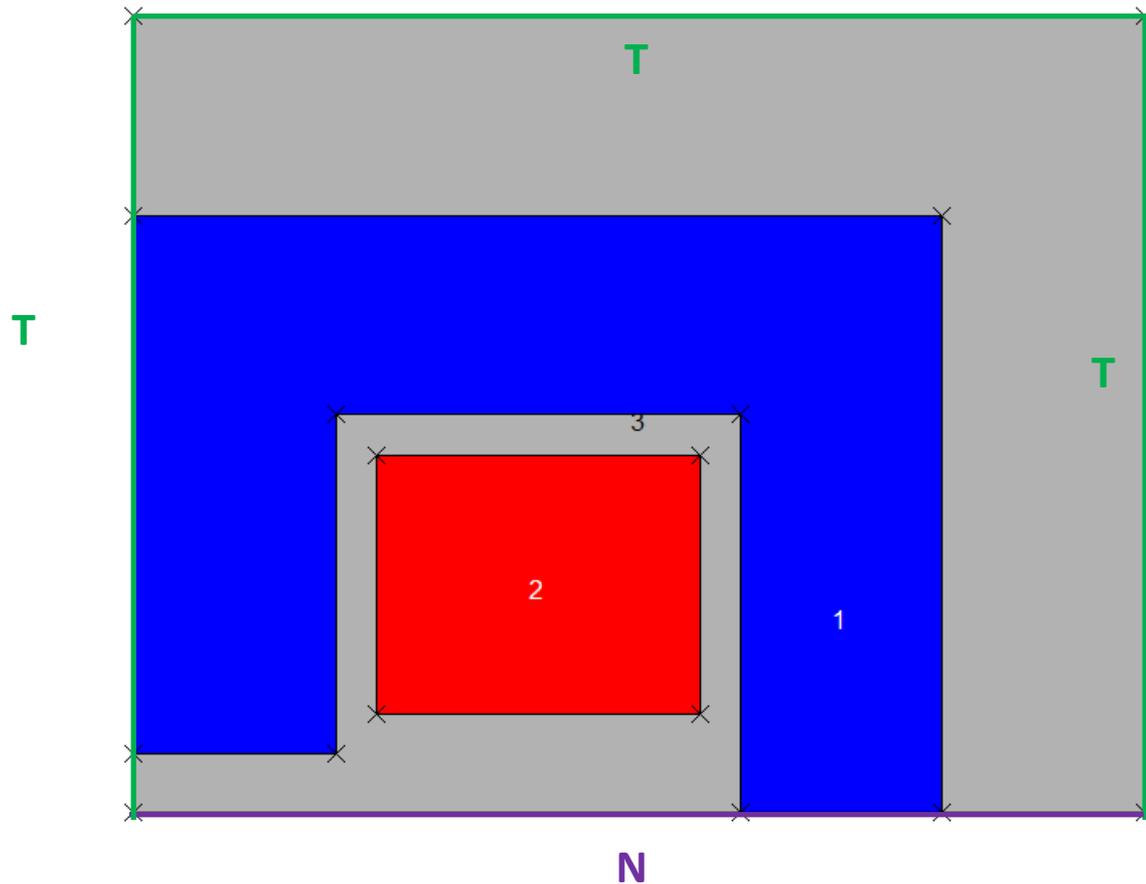
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2) Define geometry regions

3) Define regions material properties

4) Define your "universe"

5) Define Boundary Conditions

General guideline for FE models
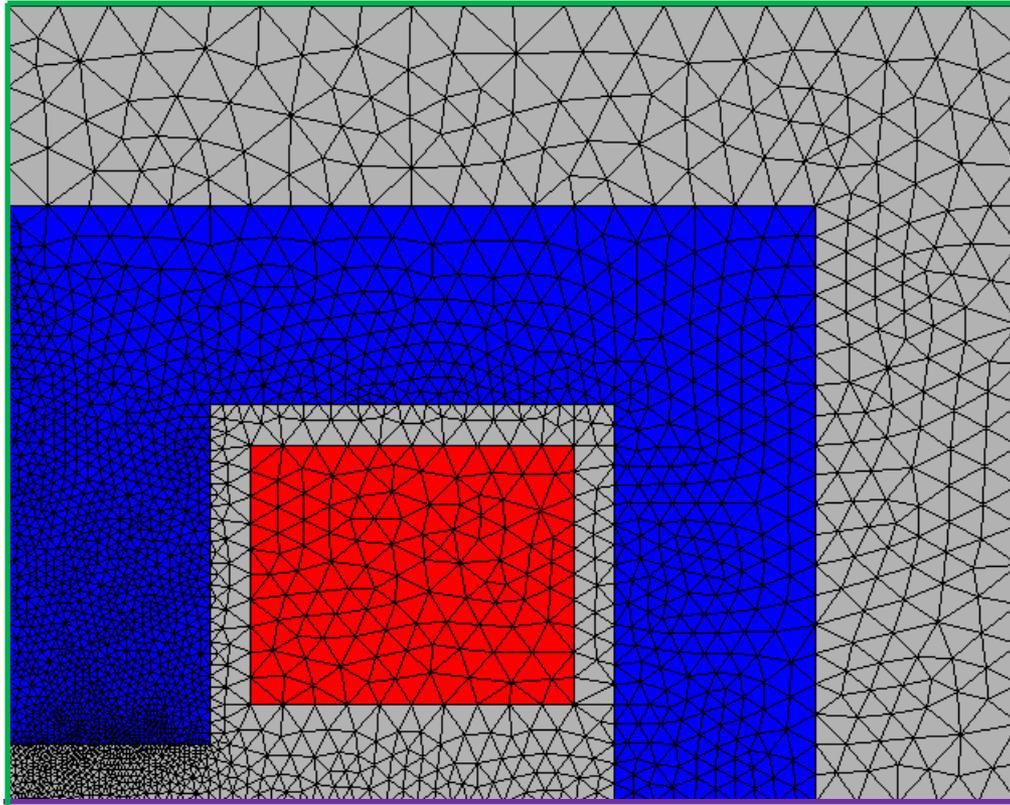
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2) Define geometry regions

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5) Define Boundary Conditions

6) Define/Refine mesh

General guideline for FE models
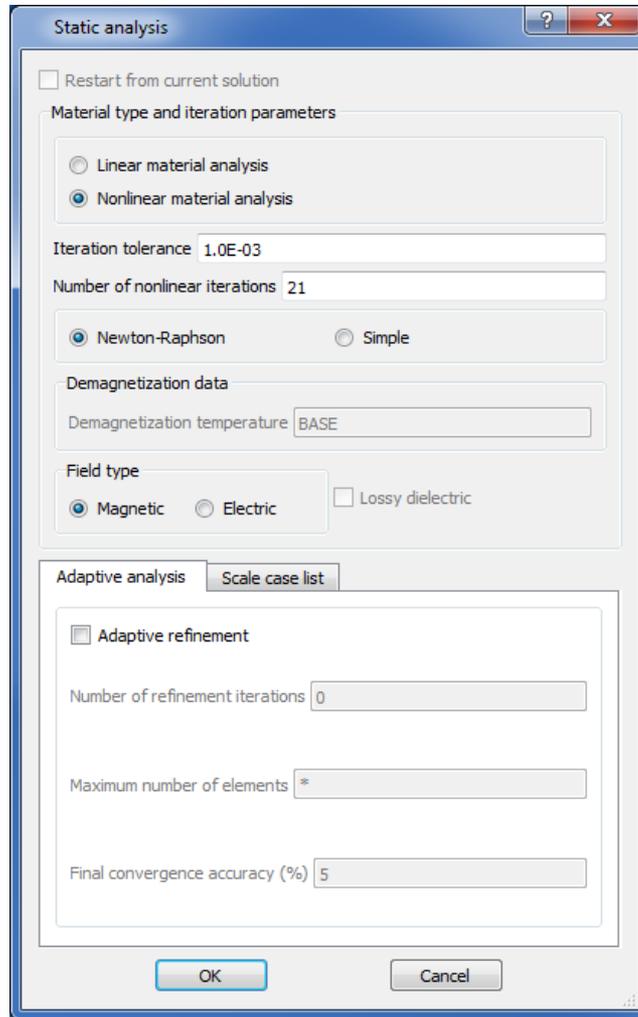
1) Reduce the model taking advantages of the symmetries

2) Define geometry regions

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4) Define your "universe"

5) Define Boundary Conditions

6) Define/Refine mesh

7) Set simulations details (convergence criteria)

Hands-on Example
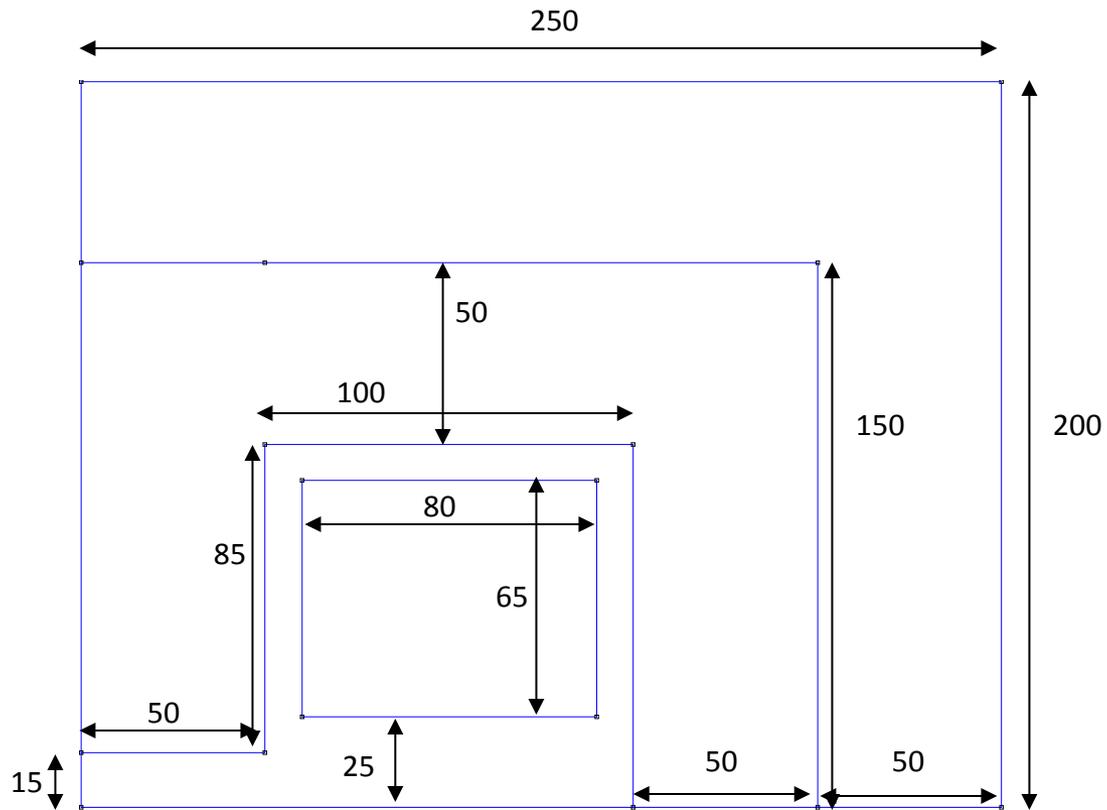
Tips

- Check your units. Be consistent with them.
- Check the boundary conditions.
- Check the polarity of your coils.
- Check the materials properties.
- Estimate the result and verify that it is correct.
- Optimize your mesh to refine the results.
- Simplify your model by removing unnecessary details.
- If the task involves repetitions with small variations, make use of scripts.
- Refer to Manual/Help File.