Computational Electromagnetics and Applications
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Indian Institute of Technology Bombay
Summary of Week 7

This week we looked into various examples using the Finite element method which we covered in the last week's lectures.

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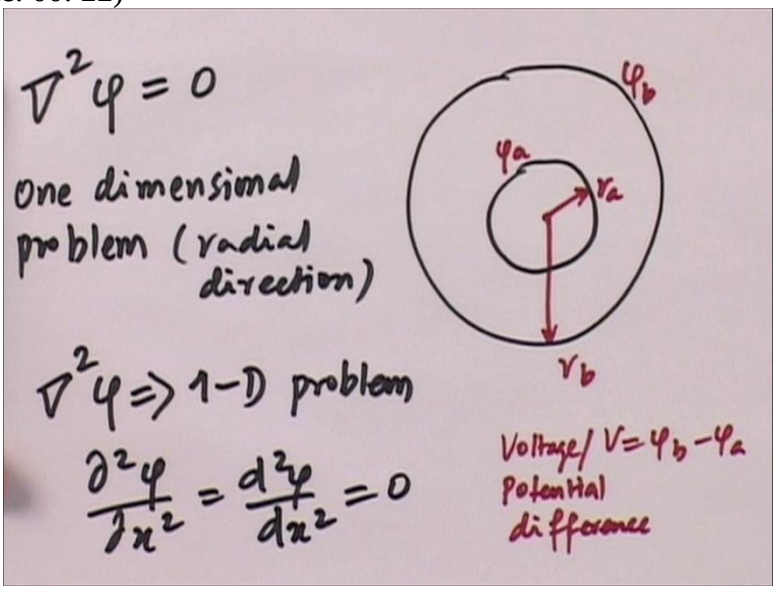

We started with a coaxial cable problem explaining its geometrical structure.

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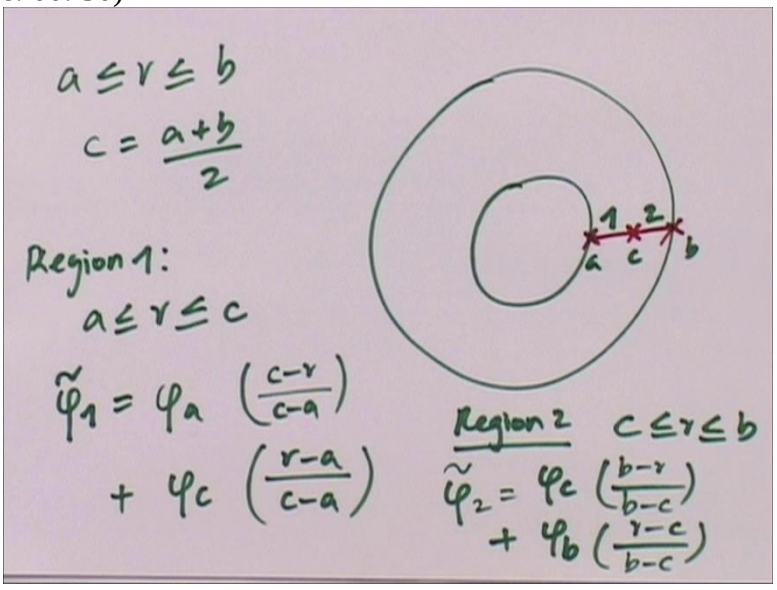

We derived the mathematical formulation to compute the capacitance between the concentric conductors.

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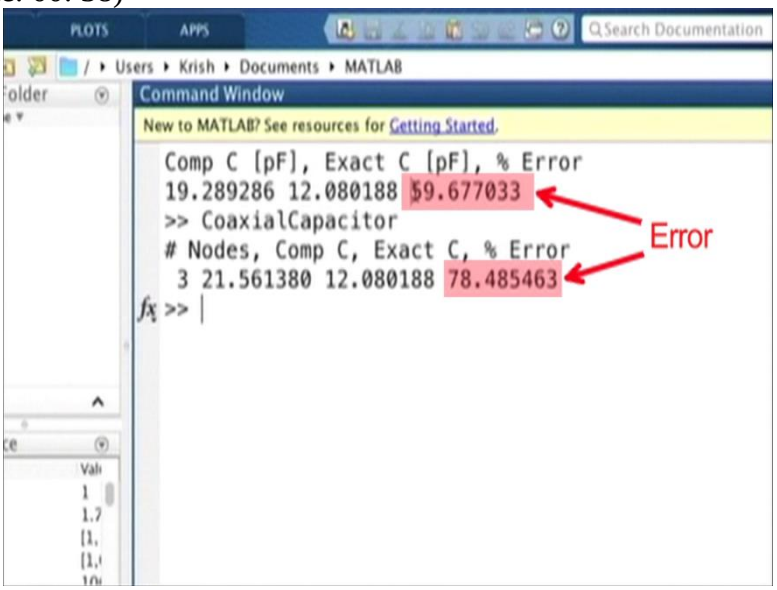

We investigated the convergence in terms of numerical error reduction in the computed capacitance value as we refined the spatial discretization.

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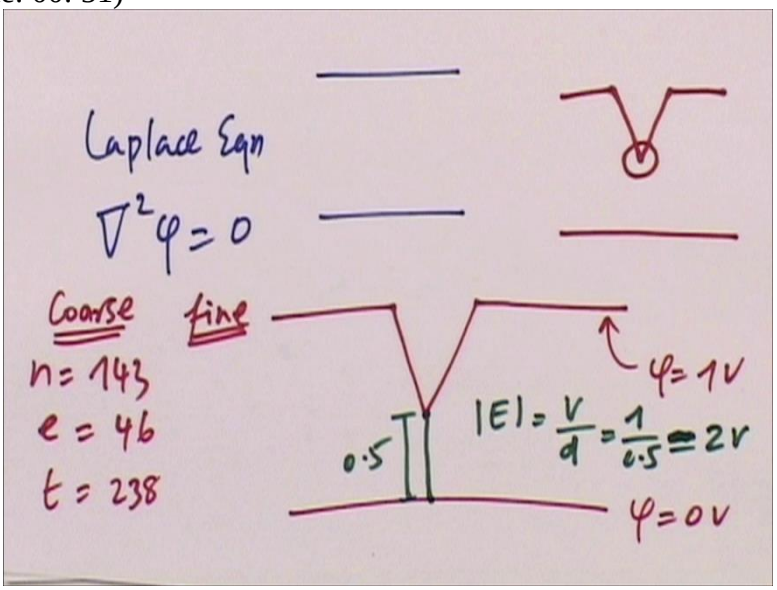

Later we discussed a conical capacitor problem with a sharp top conductor plate. This problem was an ideal problem to showcase one of the disadvantages of using nodal based finite element method.

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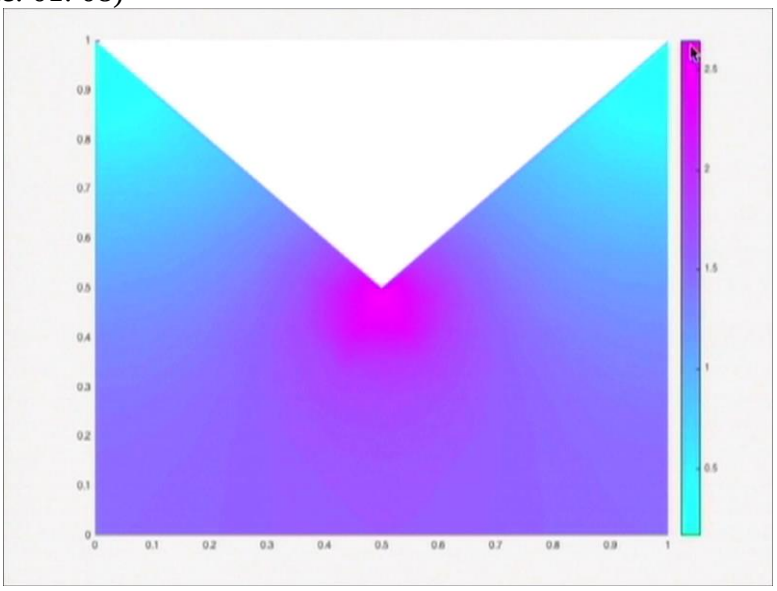

We noticed unphysical numerical singularity near the tip of the top plate conductor which is a derived consequence of using nodal based FEM formulation.

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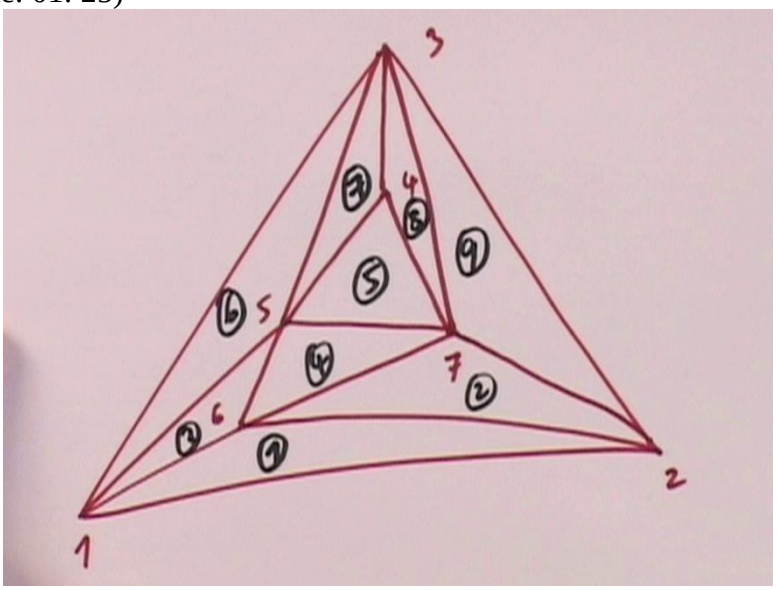

Towards the end we also solved a Laplace equation on a triangular domain.

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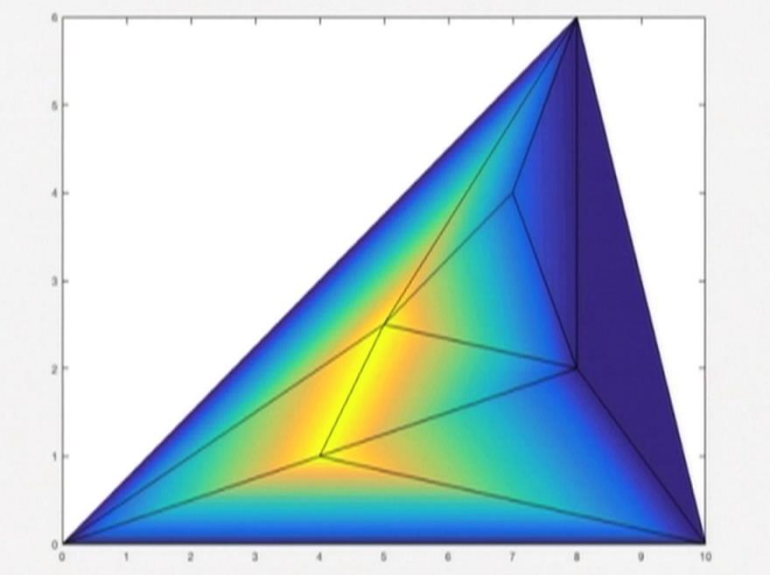

Using unstructured triangular finite elements.

Take time to go through these examples and practice coding such problems yourself or in a group. Only by solving such problems yourself you will learn and understand the concepts that we have discussed in these lectures.

Post your doubts and questions on the online forum and get it clarified. Until I see you next week Good Bye!