

Computer Aided Analysis & Design for Electrical Engineering

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Lecturer



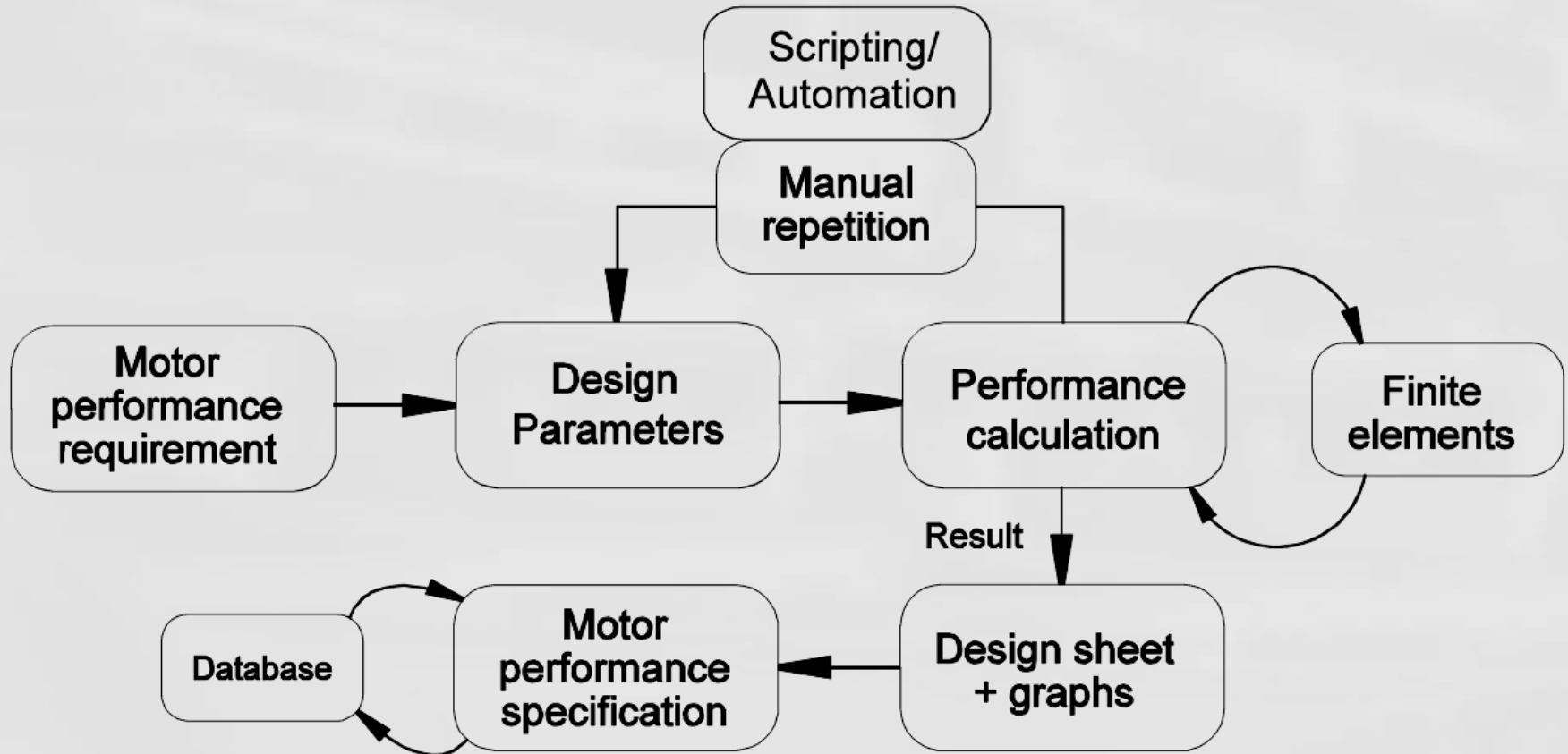
Electrical Engineering Department
Government Polytechnic, Rajkot

Chapter-3

Application of Finite Element Method in Design

- Introduction
- Basics of FEM

Modern Design Loop Process

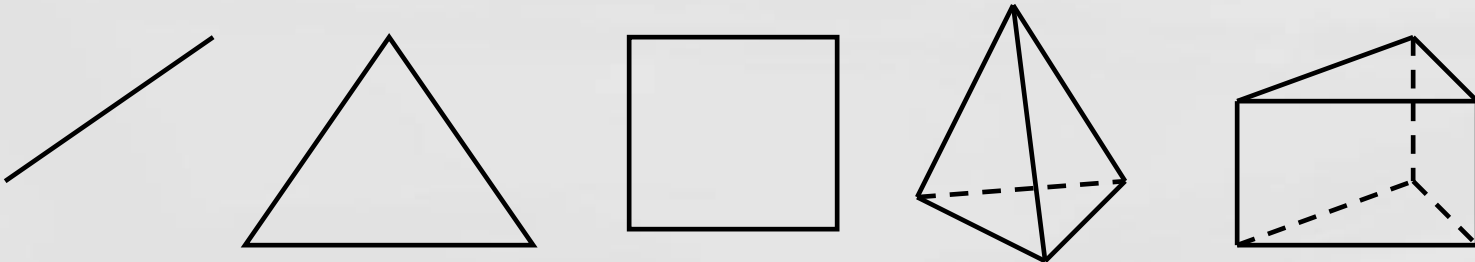


Finite Element Analysis

- Finite Element Analysis is a numerical technique for finding approximate solutions of partial differential equations and integral equations.
- The finite element method is essentially based on subdivision the whole domain in a fixed number of sub-domains.

Finite Element Analysis

- Finite Element Analysis is organized as
 - Partition of the domain
 - Choice of interpolating function
 - Formulation of the system
 - Solution of the problem



Finite Element Analysis

- Components of FEA packages :
 - Pre-processor
 - Solver
 - Post-processor

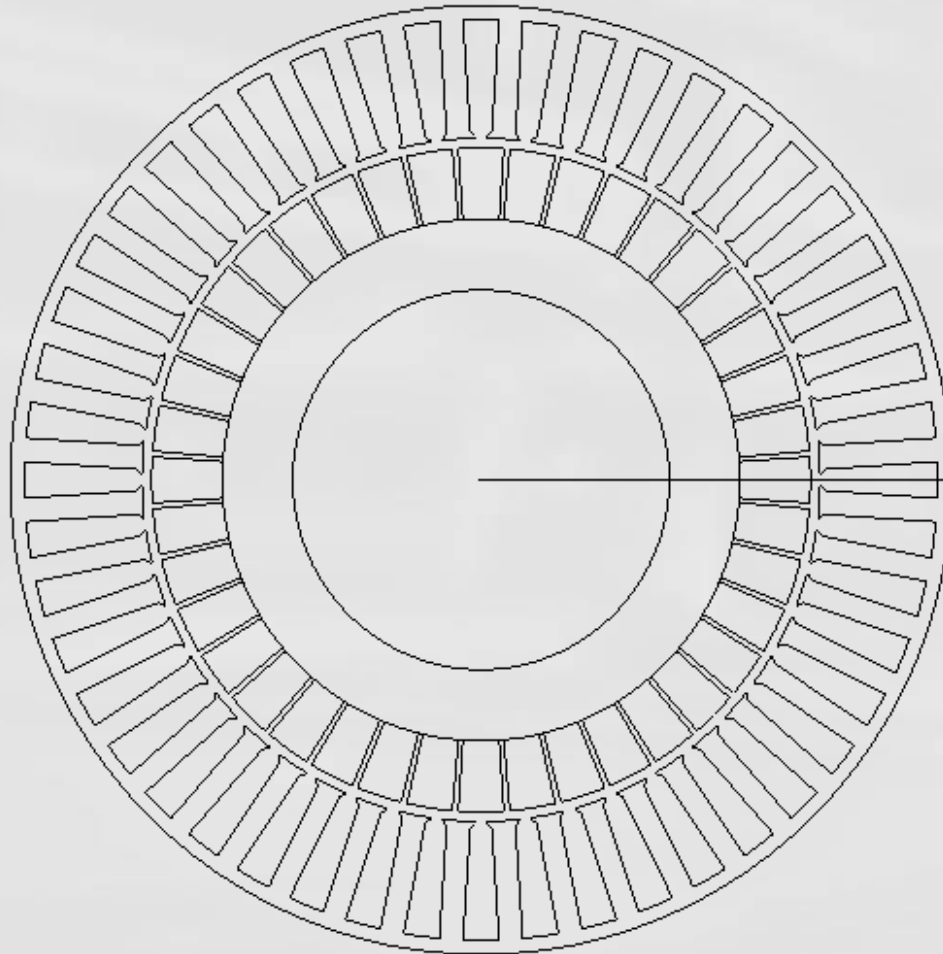
Finite Element Analysis

- **Pre-processor**
 - Drawing
 - Material
 - Electric circuits
 - Constrains
- **Solver**
 - Type of solution
 - Meshing
 - Error estimation

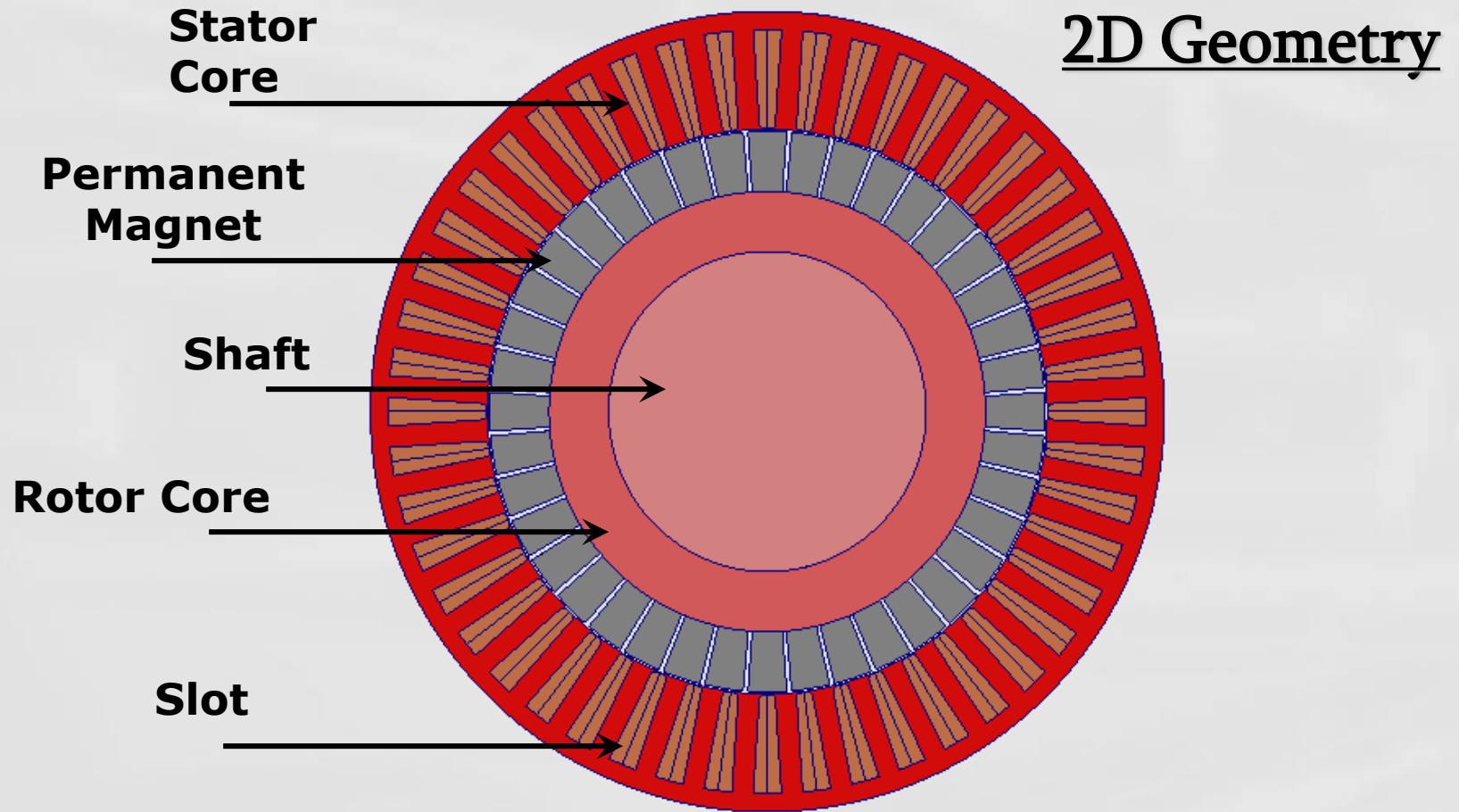
Finite Element Analysis

- **Post-processor**
 - Graphical plots
 - Numerical results
 - Information regarding solution

Finite Element Analysis

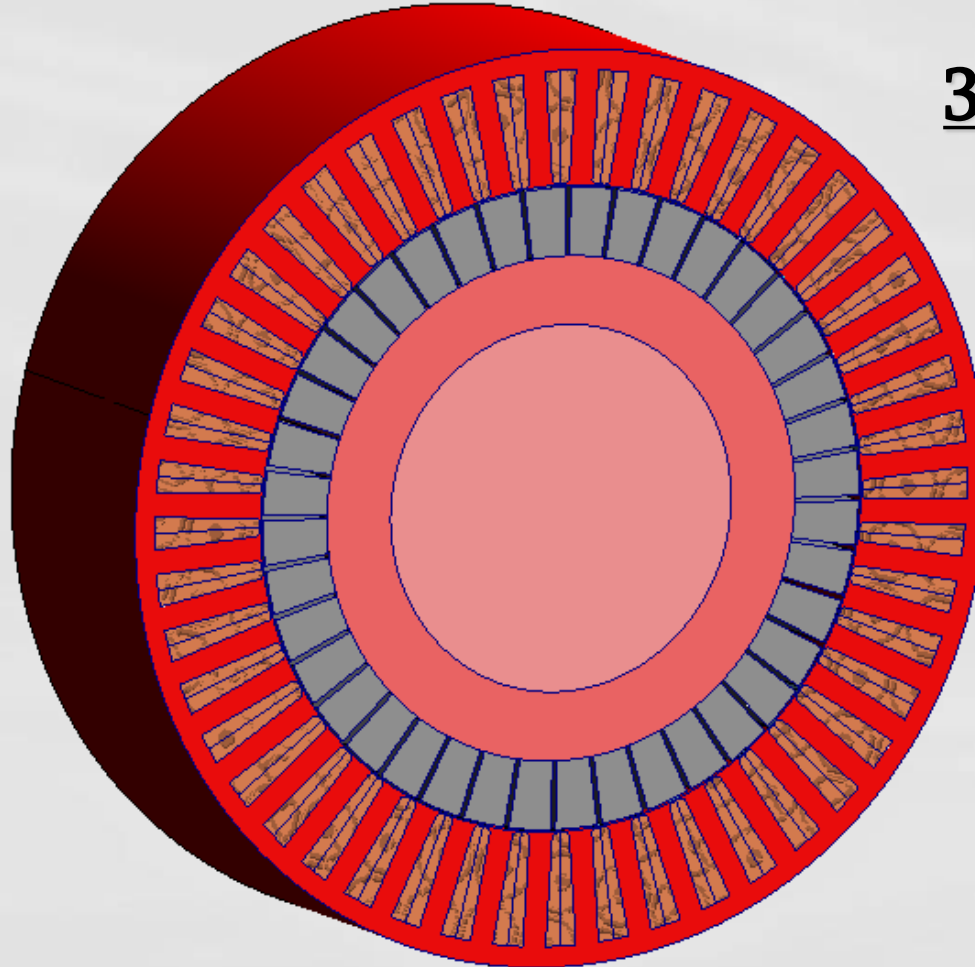


Finite Element Analysis

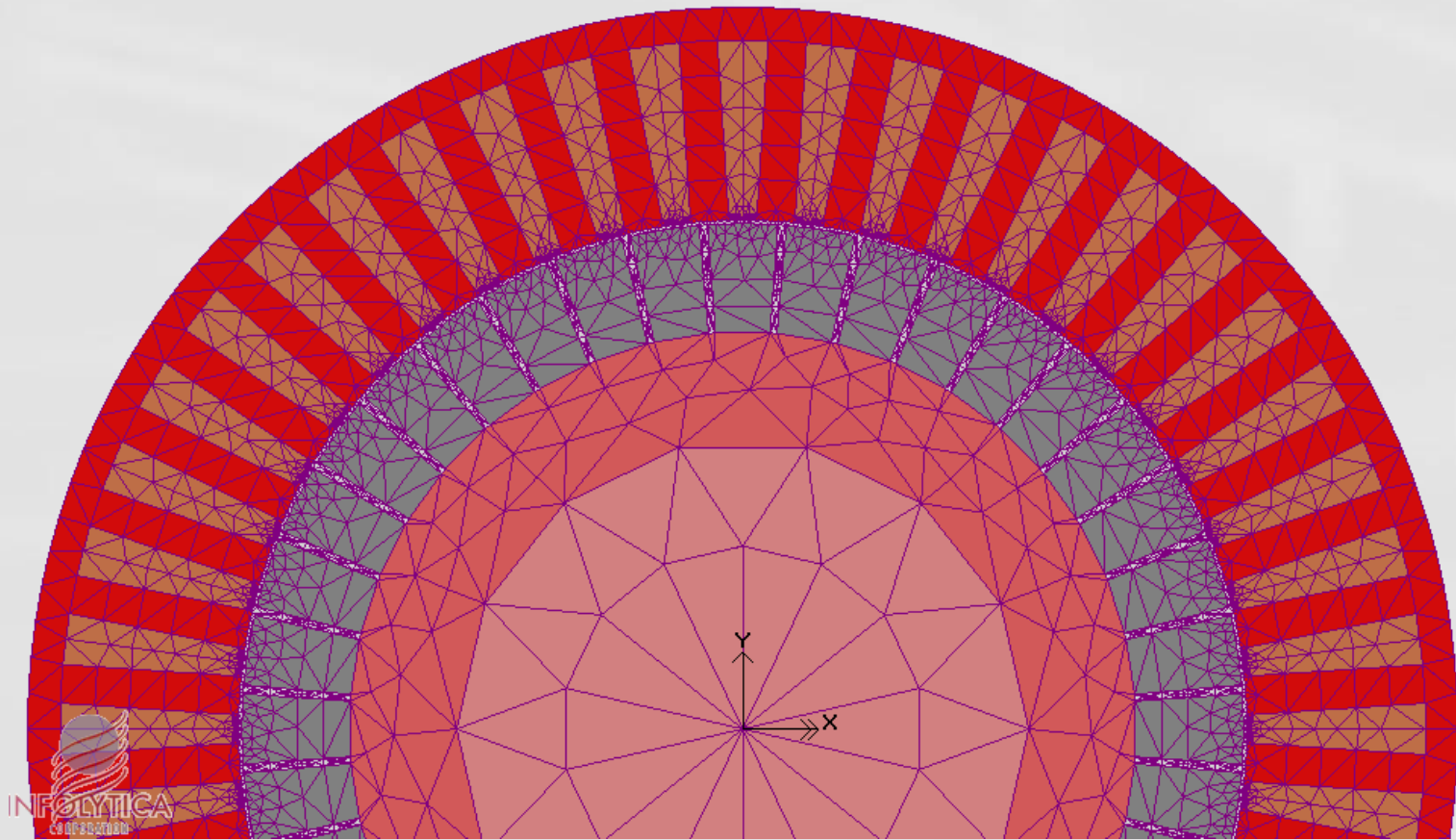


Finite Element Analysis

3D Geometry



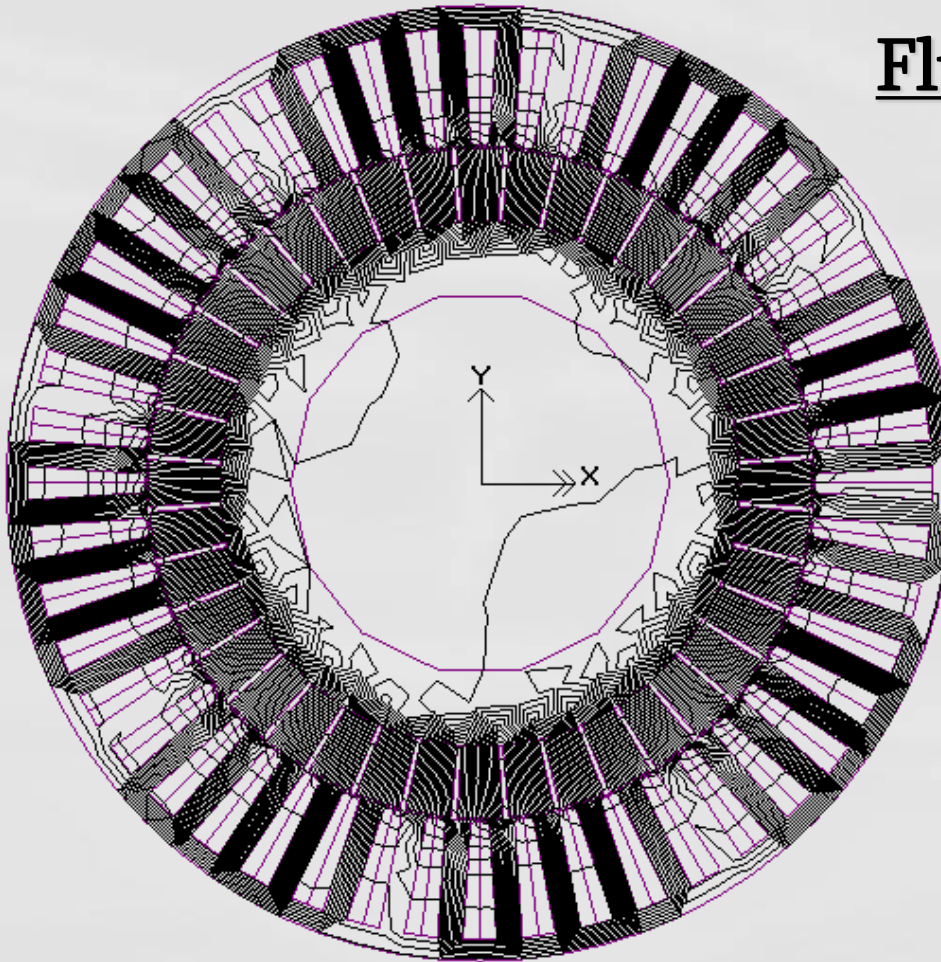
Finite Element Analysis



2D Meshing

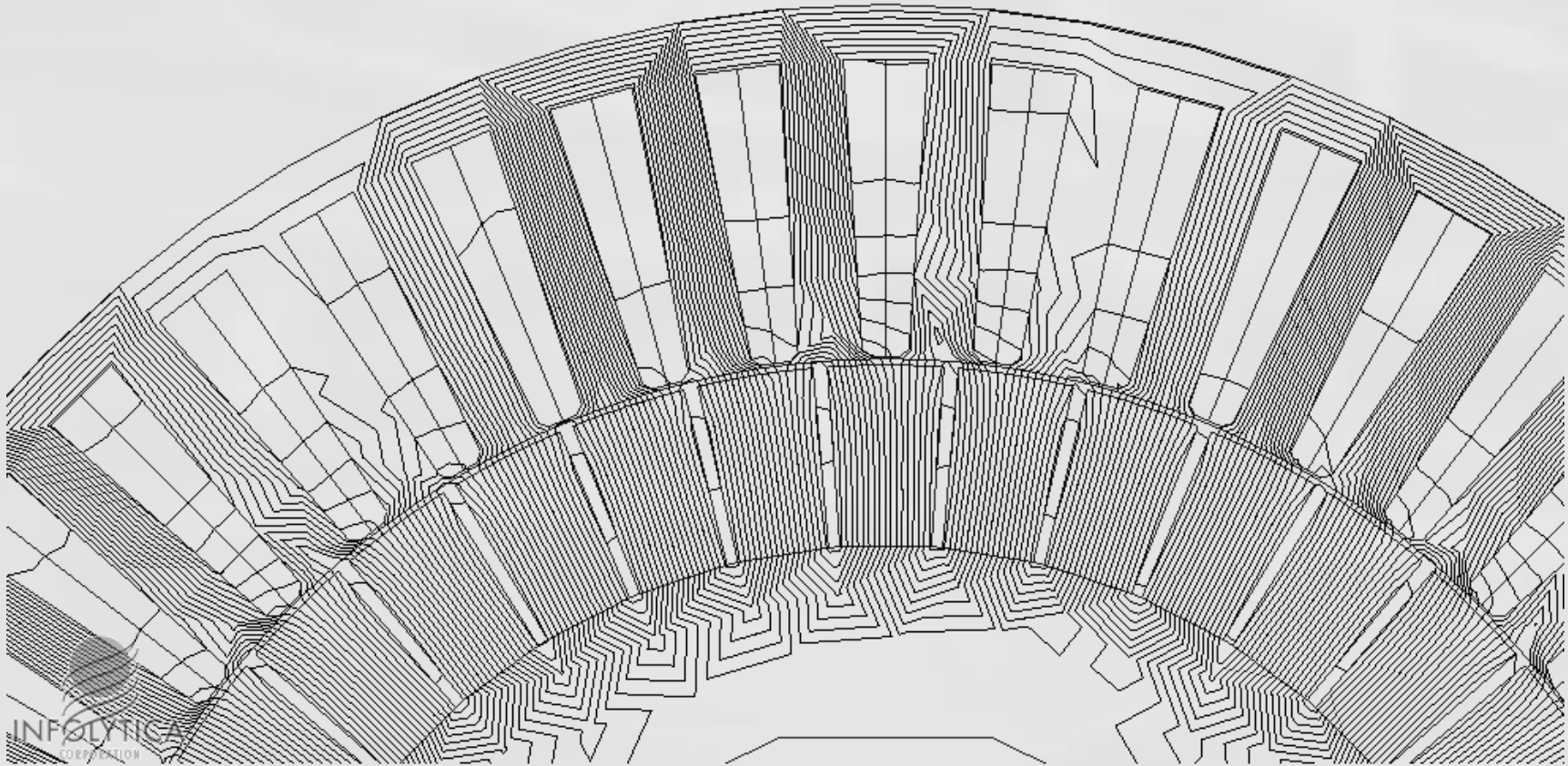
Finite Element Analysis

Flux plot

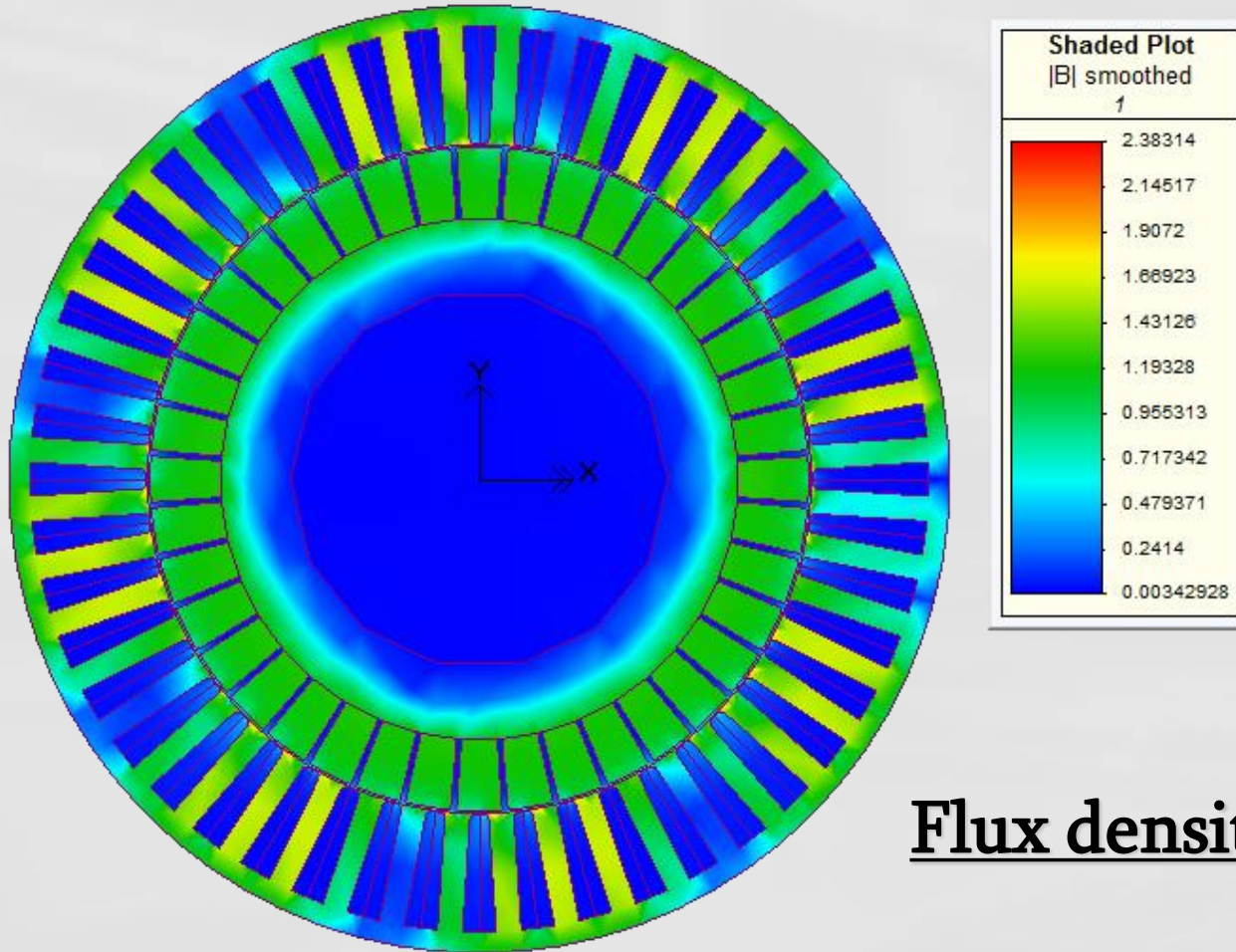


Finite Element Analysis

Flux plot

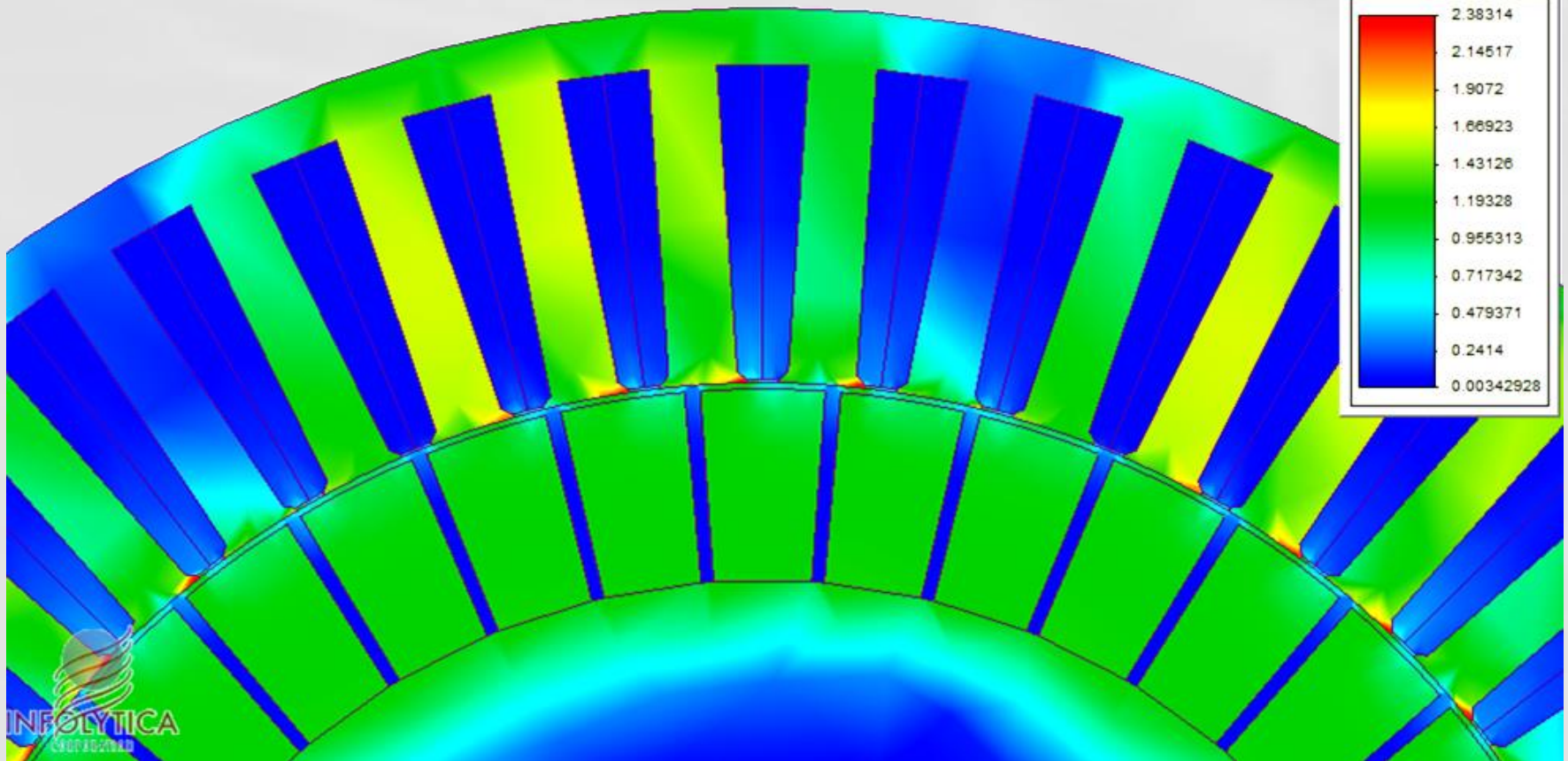


Finite Element Analysis

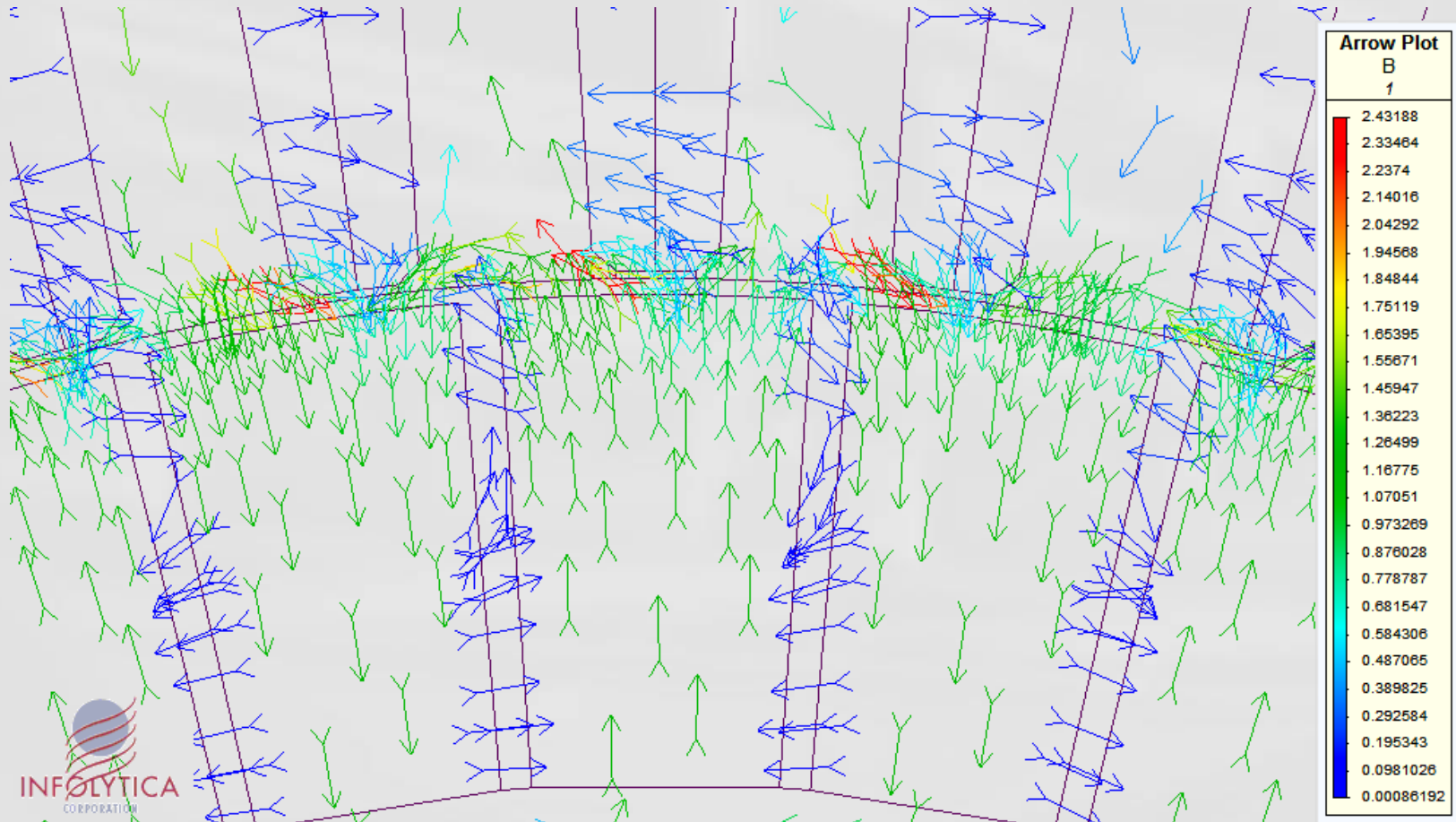


Finite Element Analysis

Flux density plot

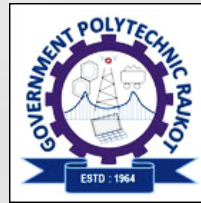


FEA Simulation (Contd...)



Flux density arrow plot

Thank You



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