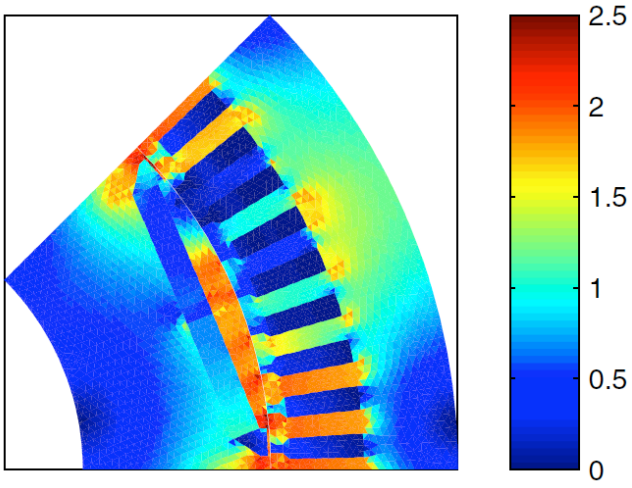
EECS 598: Electromechanics
Winter 2012



Flux density of interior permanent magnet machine

It is imperative that society finds new solutions to the generation and usage of energy. Many of the current approaches to achieving these objectives (e.g., wind power, electric and hybrid electric vehicles, energy harvesting) require efficient conversion of mechanical energy into electrical form, and vice-versa.

In this course we will discuss the analysis and design of electromechanical devices, with an emphasis on power and energy applications. Devices based upon mechanical forces generated by both electromagnetic fields and materials with electromechanical material properties will be considered.

In addition to homework assignments, midterm, and final, the course will have a final design project. This project will be selected by the student, and will be approved by the instructor provided it has significant electromechanical design content.

Brief Course Outline:

- Quasistatic formulations of Maxwell's Equations
- Incorporation of material movement into quasistatic formulations
- Properties of ferrous materials
- Energy, co-energy in quasistatic systems
- Forces, force densities
- Finite element analysis
- Design of electromechanical devices

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Prerequisites: EECS 230 or equivalent, or graduate standing.