

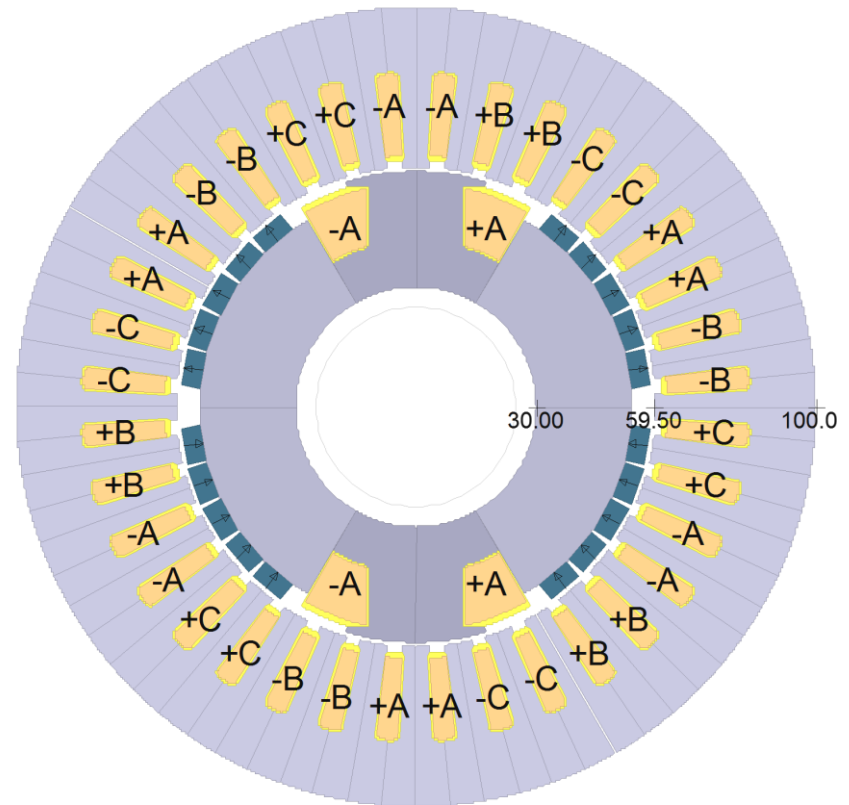


**TRUPER**

**Traction Machines  
Without Permanent  
Magnets**

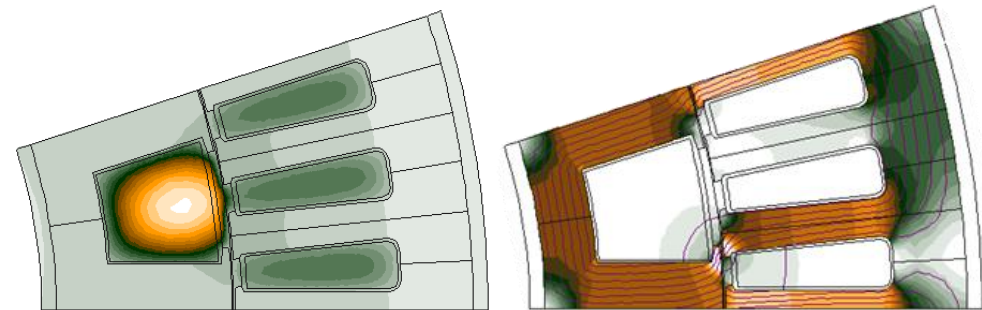
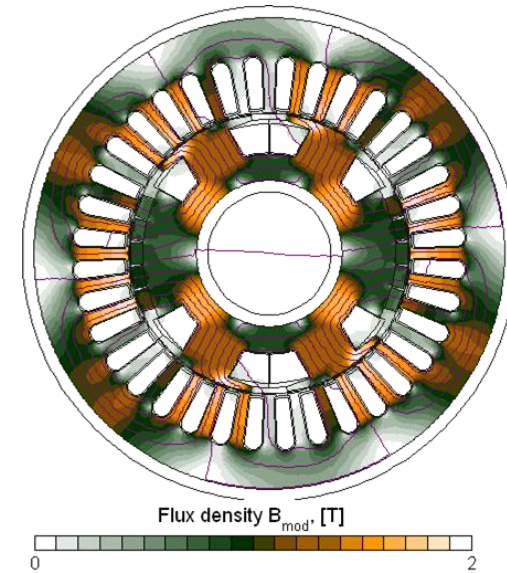
# Project Goal

- Design an electric machine for traction application without permanent magnets, or with as little permanent magnets as possible.
- Reduce material and production cost without sacrificing performance.



# Project Scope

- Study different machine topologies with low or no use of permanent magnets, such as
  - Electromagnetized machines
  - Hybrid magnetized machines
  - Switch reluctance machines
  - Reluctance magnetized synchronous machines
- Run finite element flux simulations and thermal analysis.
- Develop a machine design for a prototype.
- Build prototype and test in the IEA test bench.



# Partners, Resources & Timeframe

- **Partners**

- IPROD, Division of Production and Material Engineering at Lund University
- Energimyndigheten, Swedish Energy Agency

- **Resources**

- Lab resources at IEA, Lund University
- Production resources at IPROD, Lund University

# Contact Information ...

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# More material:

- **Papers:**

- Performance estimation of hybrid excited machine with alternating pole configuration:

<http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=6960560>

- Design and experimental evaluation of a compact hybrid excitation claw-pole rotor:

<http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=6350298>

- **Thesis:**

- Comparison of different electrical machines for Belt Driven Alternator Starters, Dan Hagstedt:

<http://iea.lth.se/publications/Theses/LTH-IEA-1067.pdf>