

# POLITECNICO DI TORINO

Department of Electrical Engineering



Politecnico di Torino was founded 150 years ago and it is now one of the largest Engineering Schools in Italy, ranked no. 1 in 2004. The research group "5e" belongs to the Electrical Engineering Department and its research covers the main fields related to energy efficiency and environment issues. The four main thematic areas are: electric machines, power electronics, electric drives and electromagnetic compatibility. The newest field of research is devoted to hydrogen systems, and in particular to the power electronics for polymer electrolyte fuel cells

## Key Research Fields & Competence Areas:

- **Electric Machines**
  - Electric/Hybrid Vehicle Traction Motors
  - Axial Flux Motors - Ironless machines
  - Dedicated Machines for Special Applications
- **Power Electronics**
  - Converters for Fuel Cell Power Conditioning
  - Power Element Building Block Converters
  - Active filters
- **Electric Drives**
  - Field Oriented Control for AC machines
  - Direct Torque Control for Induction motor drives
  - Luenberger flux and speed observers

## Institute Highlights:

- "Simulation Laboratory" using general purpose and specialist tool (circuit and systems simulations - electromagnetic and thermal simulations)
- "Enertronic Laboratory" about 600 square meters - supply systems up to 120 kVA - test Benches up to 240 Nm – 10.000 rpm Instrumentation and acquisition systems Programmable control systems
- "HySy\_Lab Laboratory" (fuel cells system laboratory).
- National and European research projects
- Industry and Academic cooperation

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