THESIS PROPOSAL

MASTER'S DEGREE
LAUREA MAGISTRALE

FEASIBILITY STUDY, ELECTROMAGNETIC DESIGN AND TESTING OF HIGH-SPEED CRYOGENIC-COOLED PERMANENT MAGNET SYNCHRONOUS MACHINES

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Keywords: Design of Permanent Magnet Synchronous Machines, Cryogenics, FEM analyses using professional software, Modelling, Testing

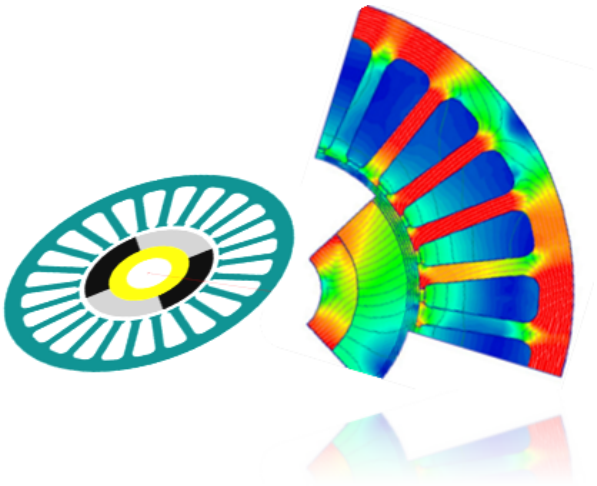
Description

The Master Thesis work aims at investigating the potentials of high-speed Permanent Magnet Synchronous Machines (PMSMs) for cryogenic pump applications. The thesis project will be carried out at the Energy Department of Politecnico di Torino, in cooperation with the R&D department of the Italian-based company Vanzetti Engineering Srl.

The technical investigations will mainly focus on the characterization of magnetic materials at cryogenic temperature and on the electromagnetic design of two cryogenic-cooled PMSMs: a 15 kW, 12000 rpm machine and a 60 kW, 30000 rpm machine. The feasibility studies will also include the assessment of different bearing technologies.

The expected duration of the Master's Thesis is **six months**.

During the thesis, the student will have the opportunity to apply to real design cases the knowledge acquired during his studies in Electrical Engineering. The candidate will acquire high-level skills on the use of professional FEM software as well as the basic knowledge on the laboratory testing procedures.



VANZETTI CRYOGENIC TECHNOLOGY