TOULOUSE TECH TRANSFER

Topology optimization software for magnetic structure design
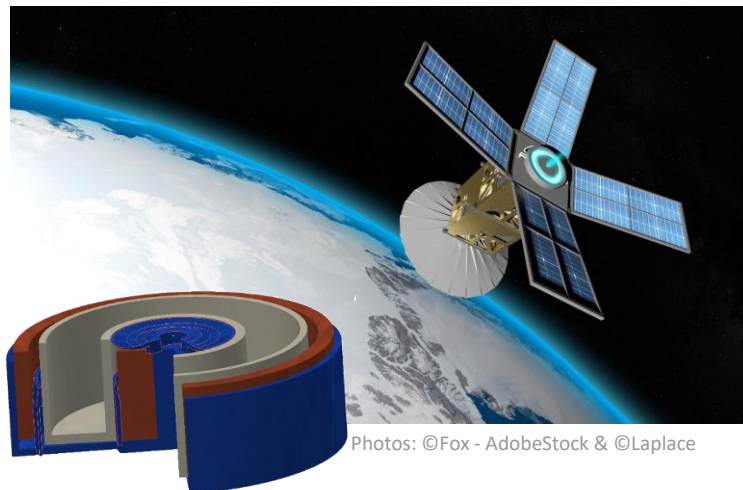
More and more areas are concerned by the « all-electric technologies » (e.g. space with hall-effect thruster and automotive sector with electric car). R&D teams must quickly design magnetic circuits that meet numerous constraints (reducing weight and volume of components, cost reduction, etc.). The solution presented herein is a topology optimization software for magnetic structure design.

COMPETITIVE ADVANTAGES

- Lightweight Design
- Compactness
- Performance optimization
- Freedom to create shape
- Reduction of development costs

DESCRIPTION*

- The key points:
  - Sofware environment composed of a sequence algorithm implemented in a solver in multi-physics simulation
  - The generative design sofware allows to overcome subjective aspects of conception
  - The software allows to design magnetic structures with magnetostatic behaviours which are complex to model

APPLICATIONS

- Electric motor
- Half-effect thruster
- Inductor
- Magnetic plasma
- Magnetic resonance imaging

Photos: ©Fox - AdobeStock & ©Laplace

Hall Effect Thruster & Topology optimisation

INTELLECTUAL PROPERTY

- Software
- Know-how

DEVELOPMENT STAGE

- Technology validated at lab level

1	2	3	4	5	6	7	8	9

TECHNICAL SPECIFICATIONS

Functional constraints	Dimensional, magnetic, physical and structural, etc.
Type of devices	All devices with magnetic structure (soft or hard ferromagnetic materials and coils)
Advantages	– Significant reducing of the mass of the piece (lightweight design). Up to 80 % in the case of the Hall-effect thruster – Constraint Optimization

LABORATORY

Laplace

CONTACT

T. +33 (0)5 62 25 50 60
systemes@toulouse-tech-transfer.com
www.toulouse-tech-transfer.com