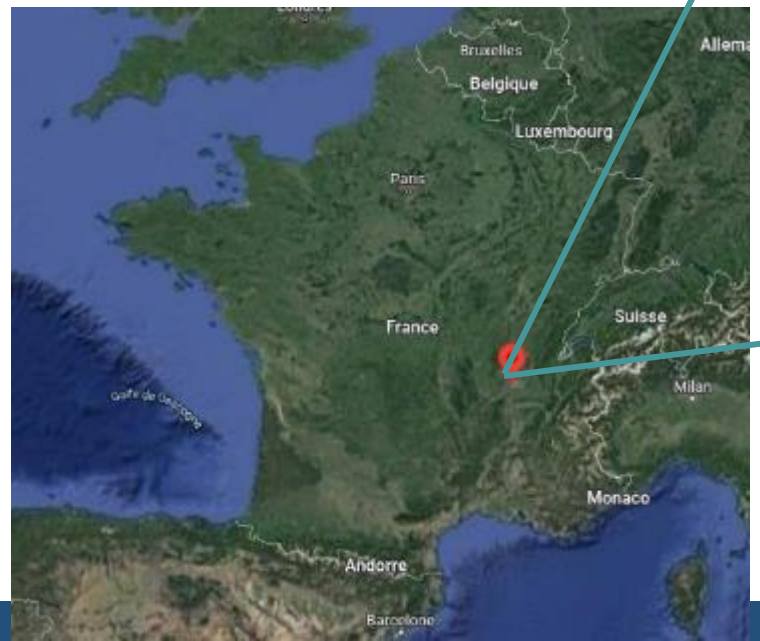
Keep MOTION

DESIGN, OPTIMIZATION AND PRODUCTION OF ROTATING ELECTRICS, MOTORS, ALTERNATORS AND ELECTROMECHANICAL ACTUATORS

KeepMotion presentation

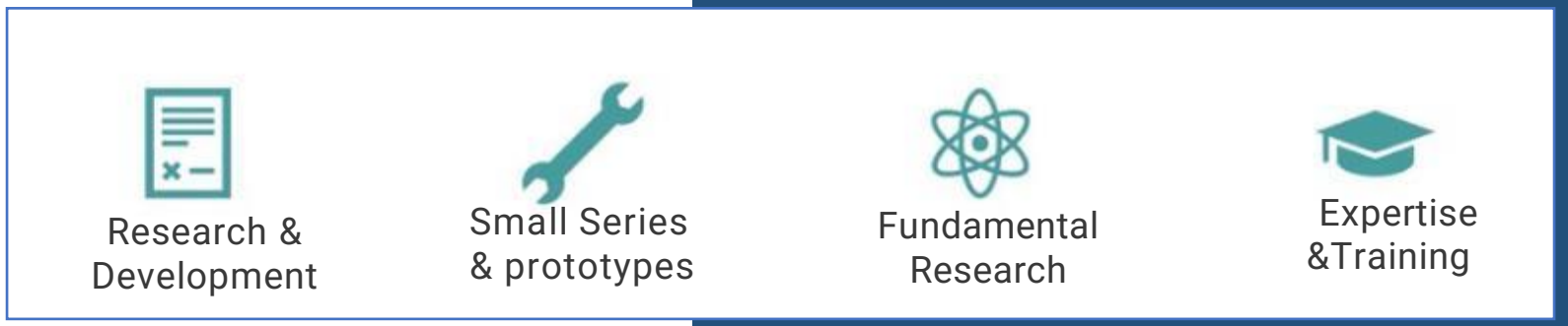
Objectives

- Luzinay, near to Lyon
- Creation in 2010
- 1000 m² workshop with 10 T capability



KeepMotion intro

❖ **Specialized in Electromagnetic and electromechanical engineering**



STUDY Activity ❖ Our Softwares

❖ Electromag

ALTAIR

Ansys

MAXWELL

❖ Mechanical & thermal

Ansys

MECHANICAL

ANSYS®

FLUENT®

❖ CAD

alibre

AUTODESK®

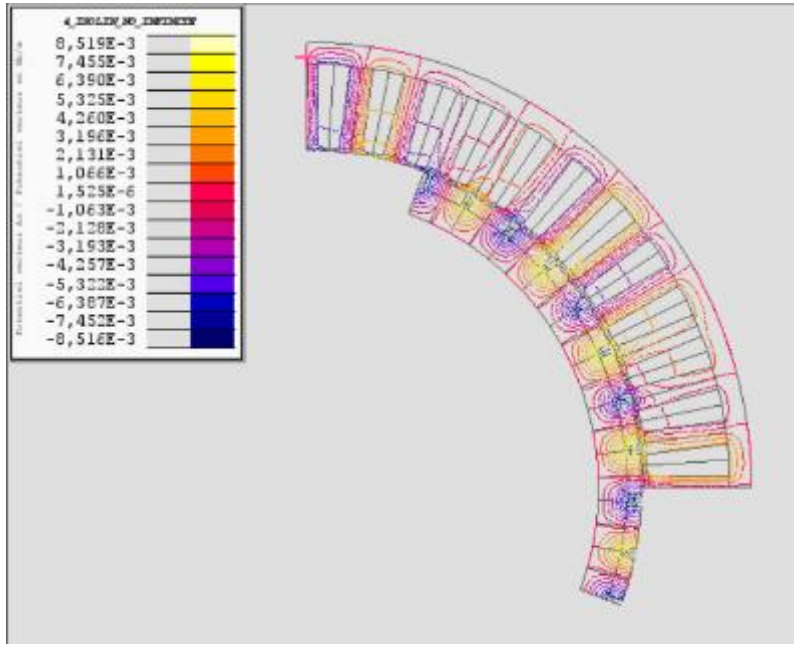
FUSION 360™

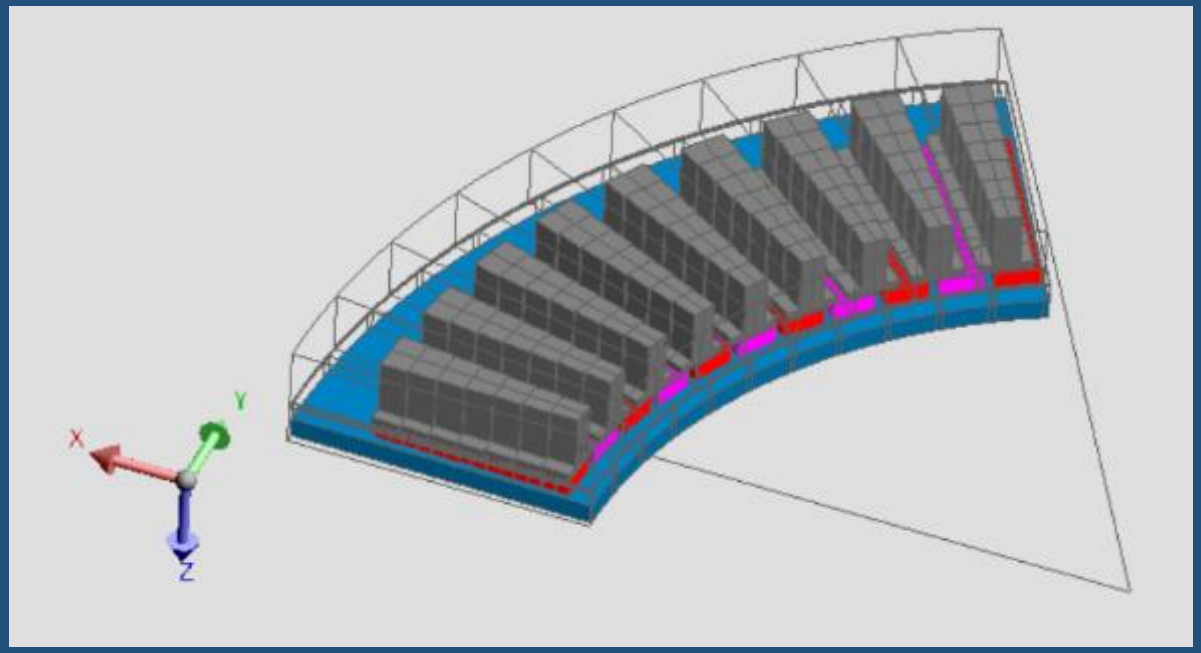
STUDY Activity

❖ **Electromechanics simulations & machine dimensioning**

- Electromagnetic

(Torque, losses, BEMF, electrical data, …)

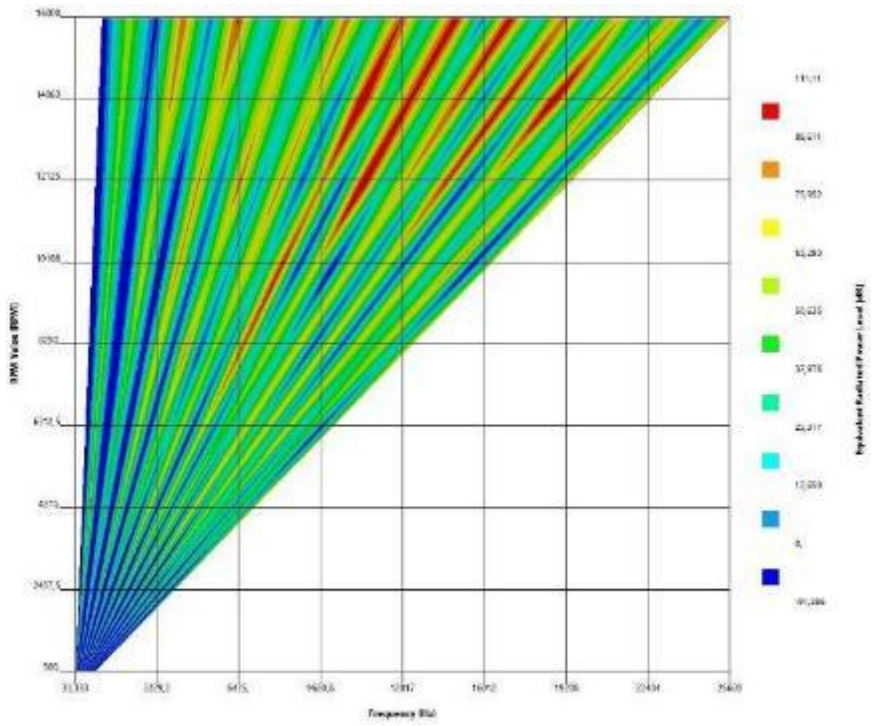


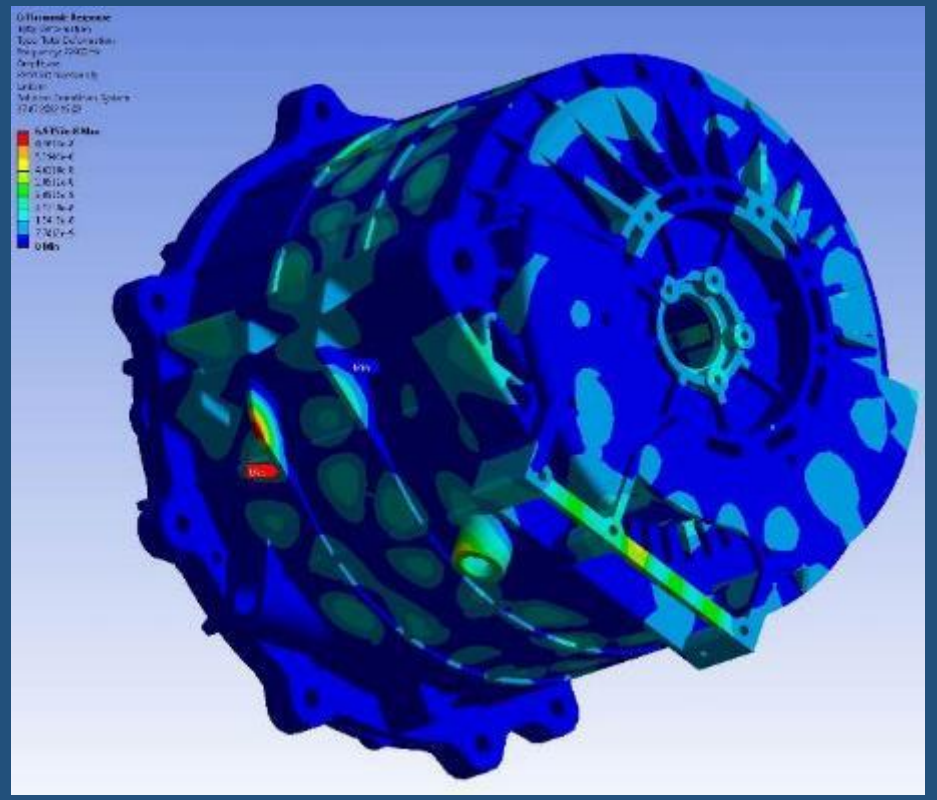


Study activity

❖ **Electromechanics simulations & machine dimensioning**

- vibration and NVH





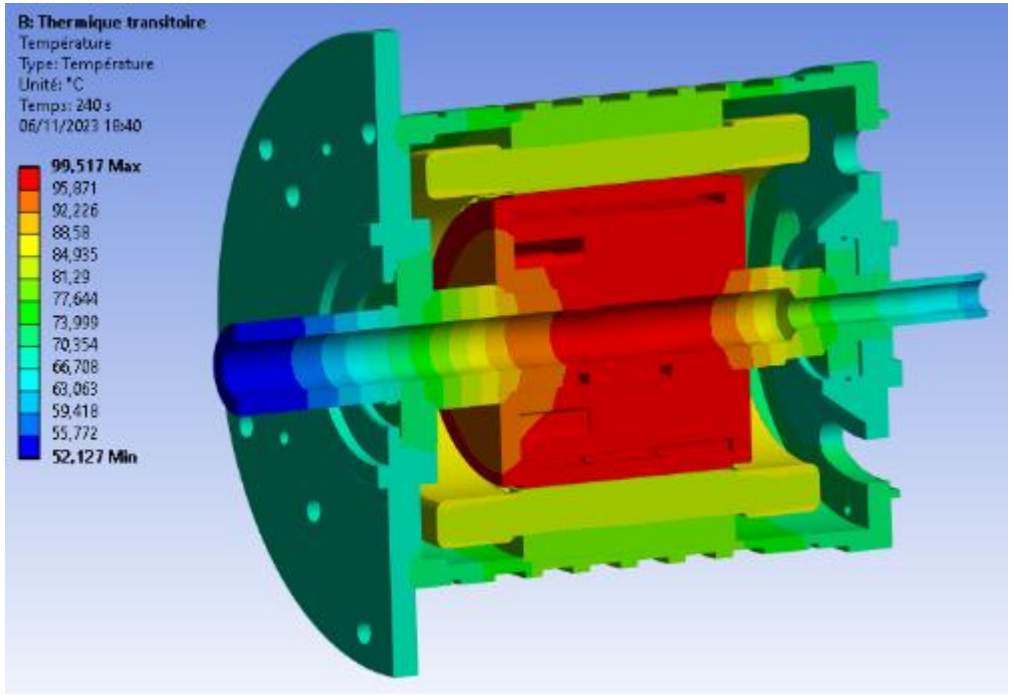
Study activity

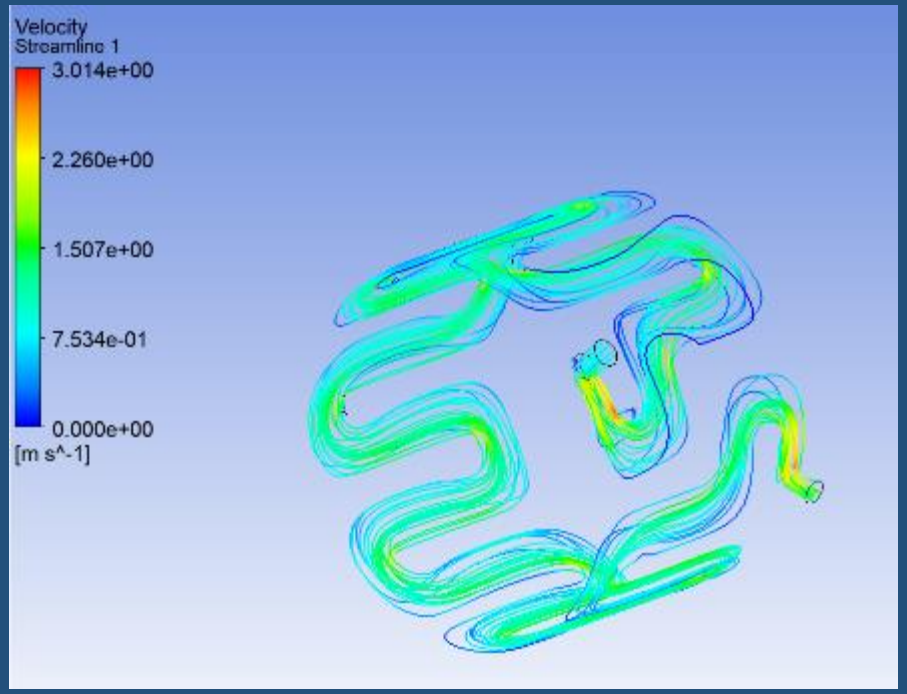
❖ **Thermal**

- nominal point and transient

- cooling circuit

Regressive exchange coefficient based on measurement and analytic approach



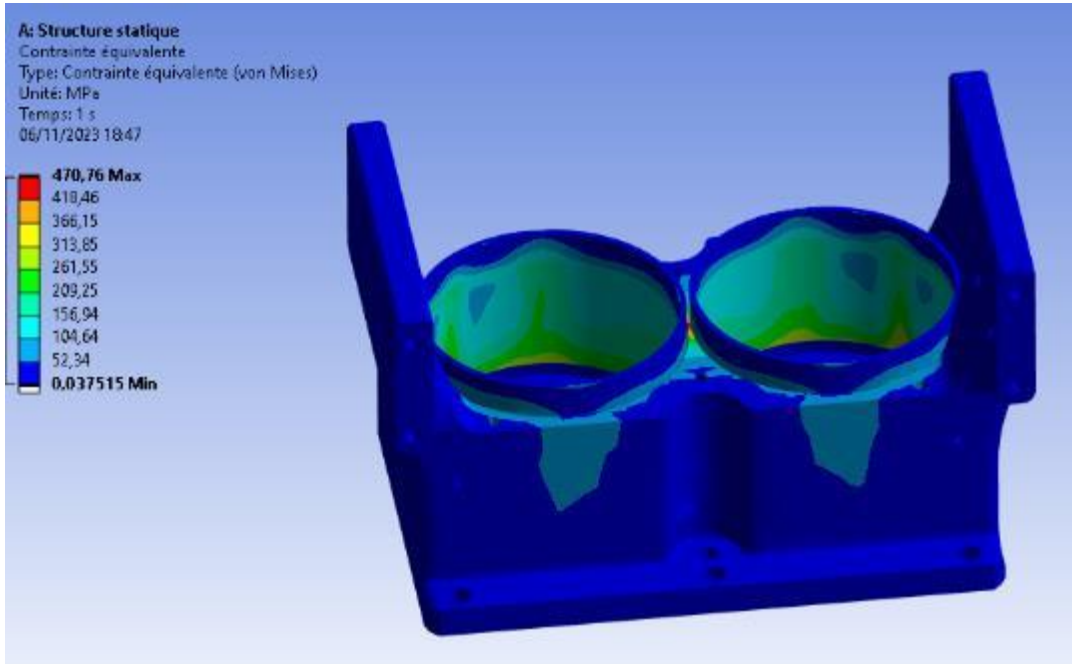


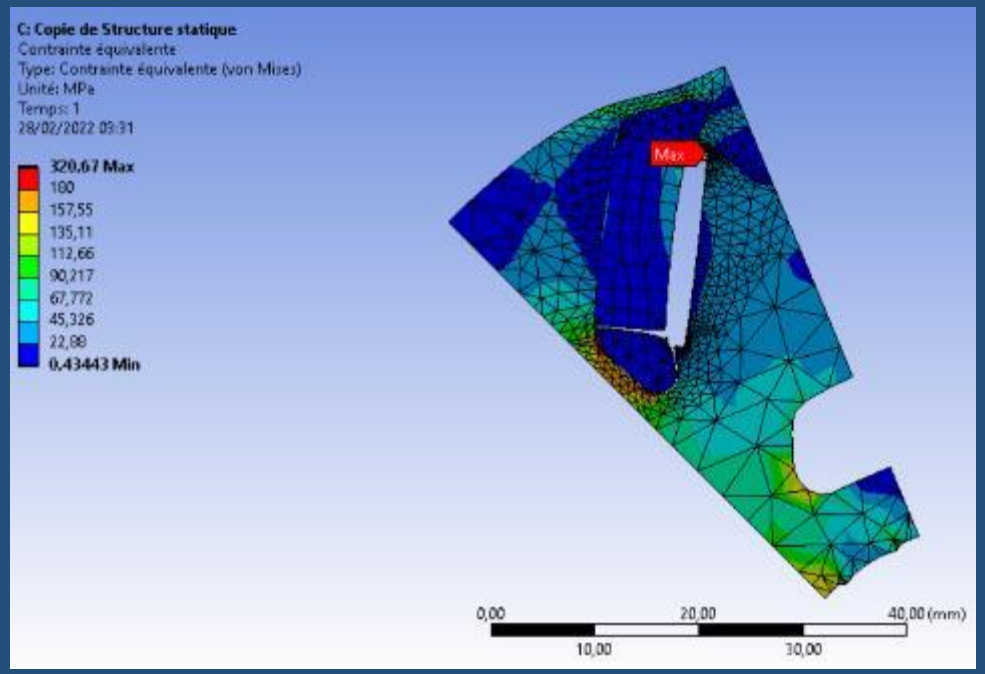
Study activity

❖ **Mechanical**

- press fit

- centrifugation



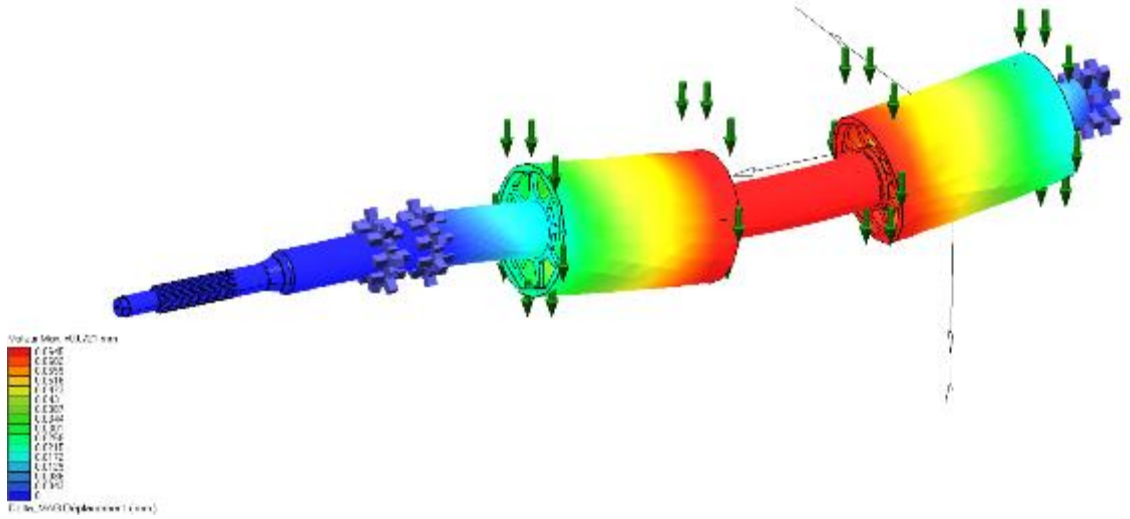


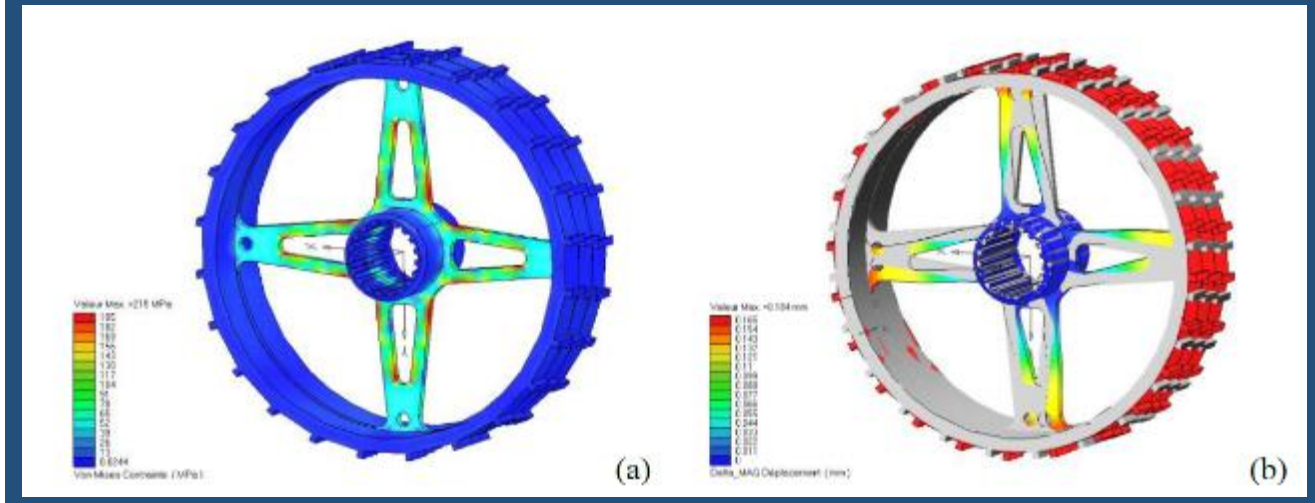
Study activity

❖ **Mechanical**

- Modal frequencies and critical speed

- torque transmission

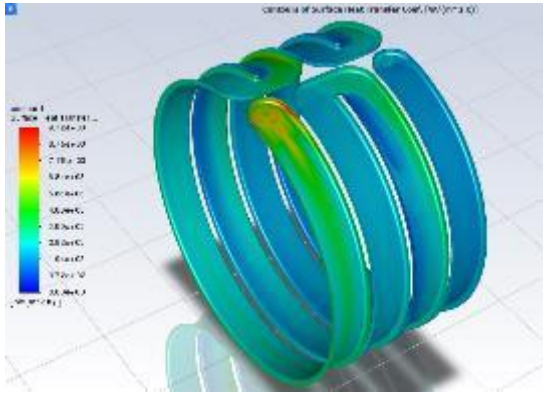


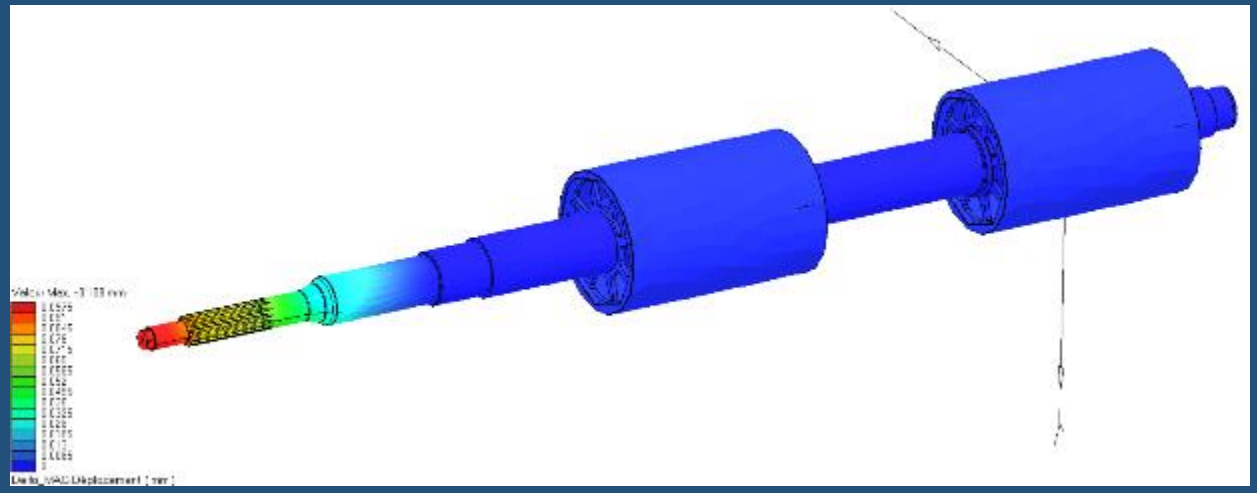


Study activity

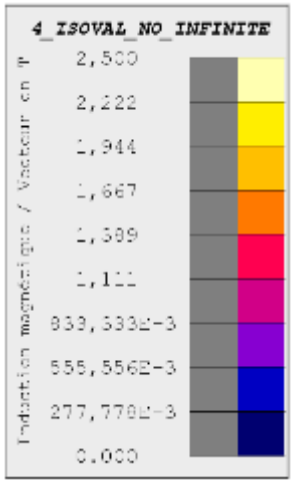
- **This are only examples**

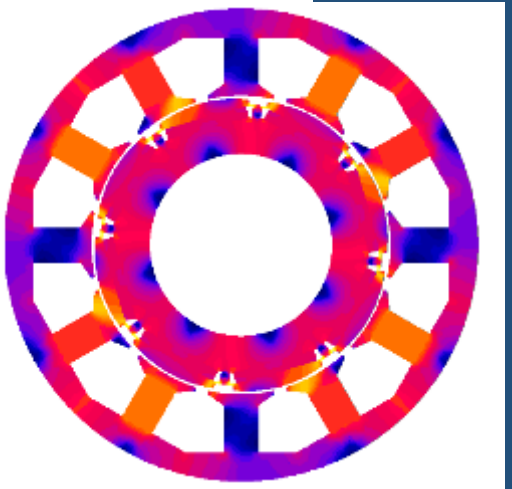
For more information let’s discuss directly

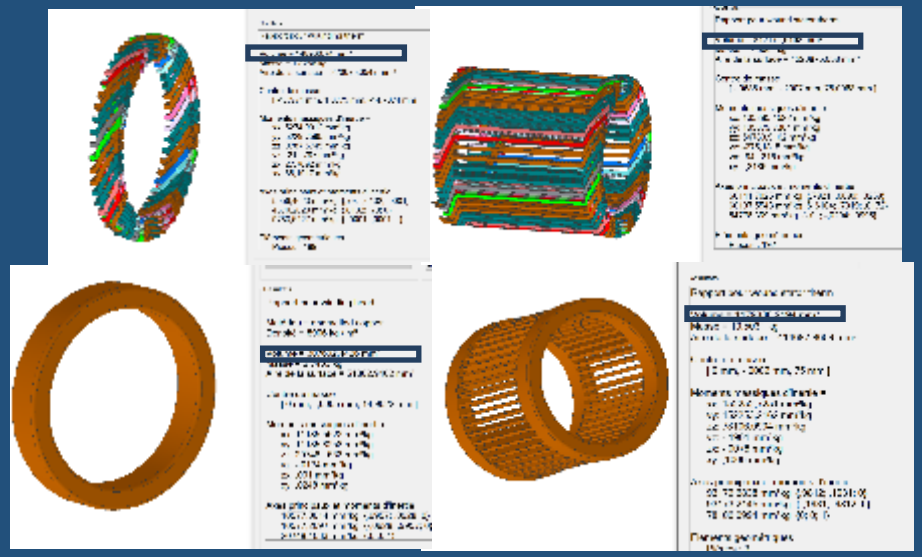




- heat transfer coeff
- multiphase machine
- hairpin winding
- multi rotor machine
- …

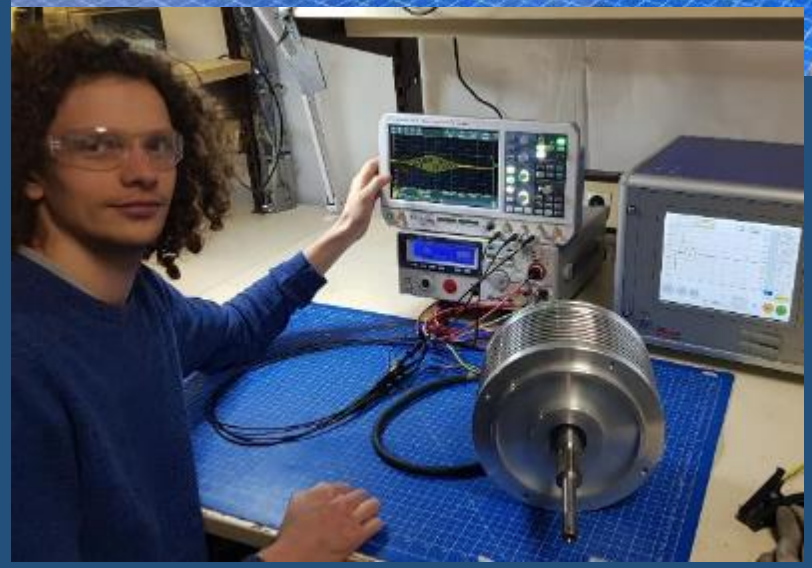






Prototyping activity

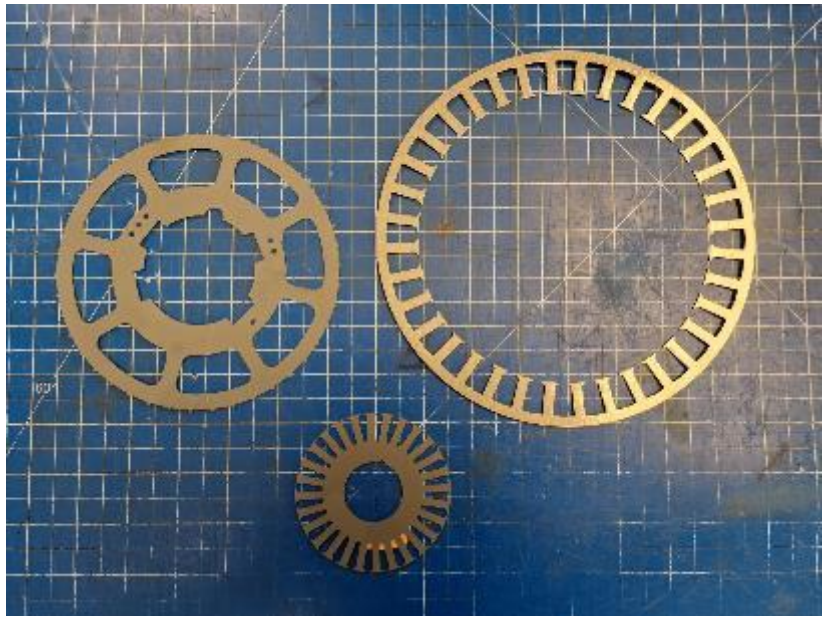
- Lamination cutting
- Manual winding
- semi automatic winding
- potting and impregnation
- Mechanical assembly
- electrical testing
- test on bench



KeepMotion knowledges

❖ **Laser cutting**

- from 0,1 to 0,8 mm thickness lamination
- under 15 µm precision



Projects carried out by KeepMotion since 2010

420

completed projects

Of which 40%

On mobility subjects

Over 20

Motor prototypes every year

2

PhD about multi-phase machine

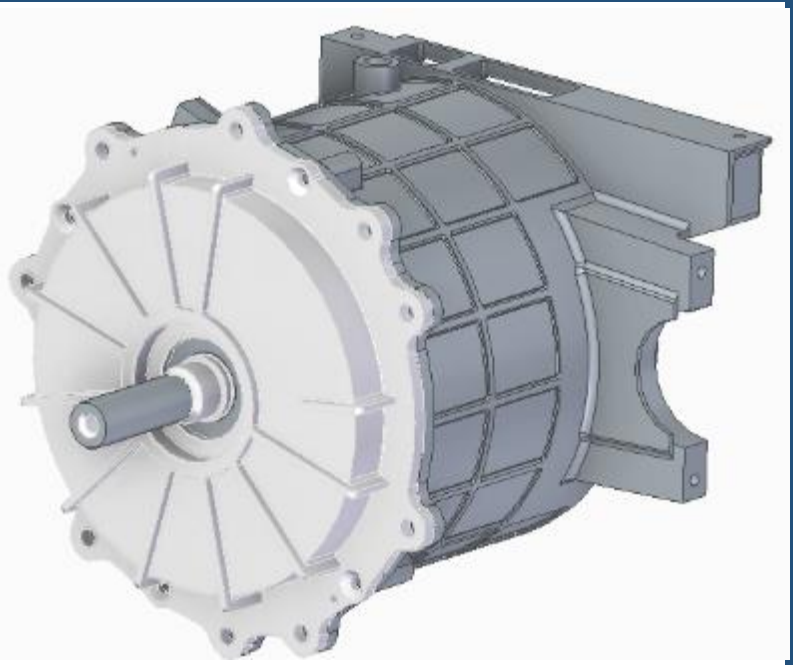
Automotive car for foreign automotive brand

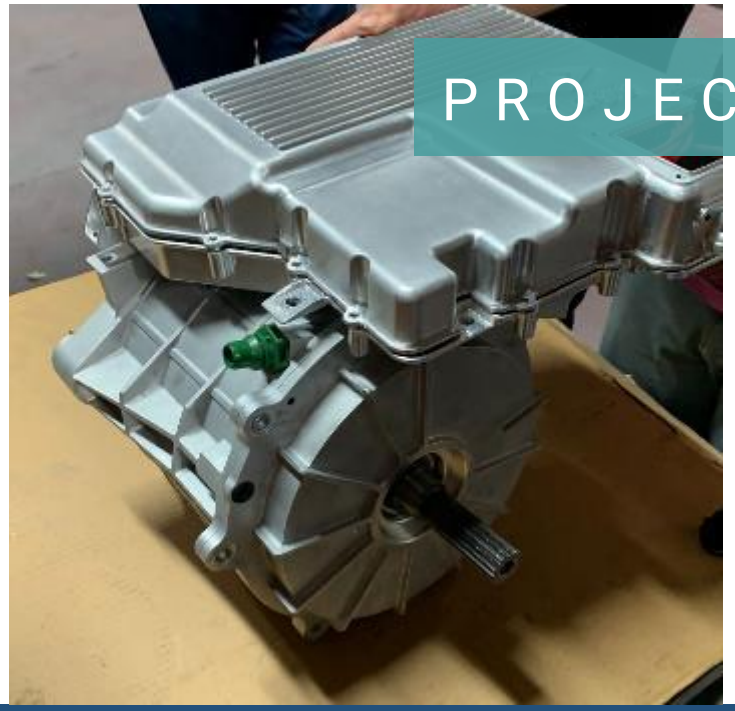
Key figures

- Power up to 165 kW
- Mass: under 46kg with mechanical fastenings
- Up to 18 000 RPM
- Dimensioned for high range production (over 150 000 every years)

Completion time

12 months





PROJECT A

Boat motor

Key figures

- Power up to 100 kW
- Mass: under 55kg with mechanical fastenings
- Torque up to 450 N.m
- Fully sealed for full time under sea-water use

PROJECT M

Industrial special machine

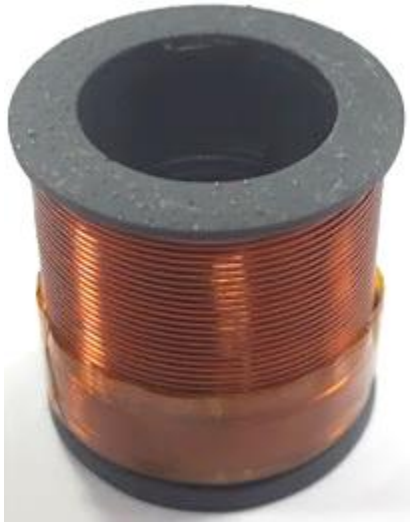
Key figures

- Up to 85 N.m
- Fully integrated mechanical features
- Direct drive motor

Linaer actuator for metalic writing

Key figures

- Optimization of the size (2 time reduction)
- 3 ms permutation time
- Local production of 2000 pieces a year



PROJECT L

Embedded micro actuator

Key figures

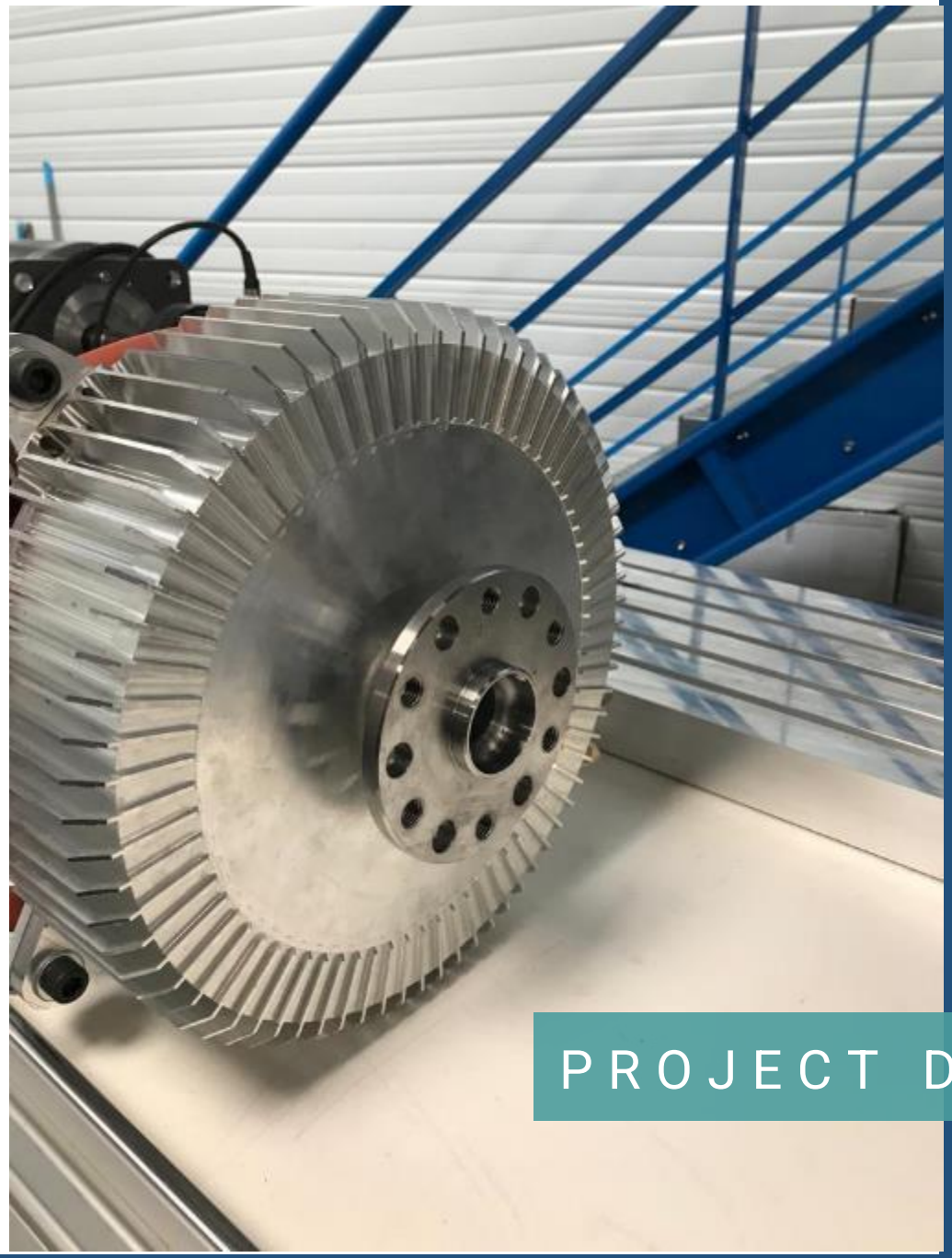
- Less than 3 mm thickness
- Cost effective design

PROJECT C

two-seater electric aircraft motor

Key figures

- Power up to 70kW
- Mass: under 20kg with mechanical fastenings
- Redundancy features



PROJECT D

Aemot hydro generators

Key figures

- Full electromagnetic and mechanical design
- Teaching of production process for hydrogenator
- Power up to 4MW
- Open load on grid connection
- Up to 11 kV

Completion time

2 months

PROJECT E

KeepMotion generic test benches

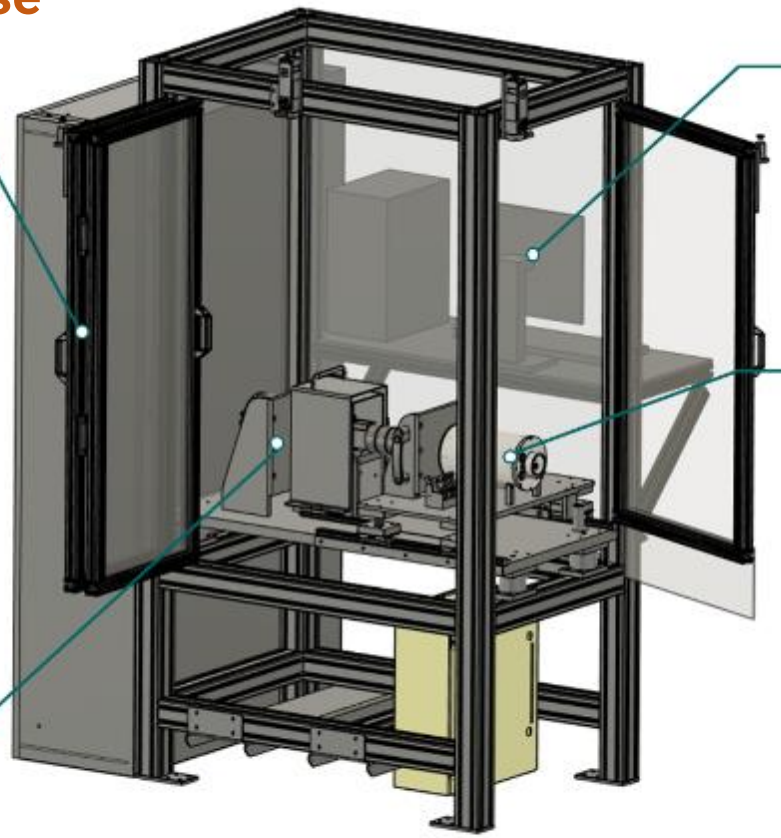
❖ Electric motor parameters measurement and expertise

LabVIEW real-time acquisition system - Compact RIO

Measurement system based on National Instrument's Compact RIO, combining the computing power of an FPGA with a reliable, predictable real-time processor.

The acquisition boards are specifically adapted to the signals being measured, to take full advantage of their performance.

Drive motor designed and manufactured by KEEP MOTION



Human Machine Interface

The HMI has been designed using LabVIEW to provide an intuitive interface and a customized display according to the tests and results to be displayed.

Fully customizable tests

No-load testing
- FEM measurement
- Resolver timing measurement
- Measurement of friction losses
- Vibration measurement

Short-circuit testing
- Measurement of short-circuit currents
- Mechanical power measurement

Load tests
- Mechanical power measurement
- Efficiency measurement
- Temperature measurement

KeepMotion custom test benches

❖ **Custom requests for process**

- Process test bench
- high power/ high speed test bench
- electrical property testing

High power testing up to 2,5MW

LV and MV electrical compliance

Nomex laboratory cutting

Renault electrical academy

Key figures

- More than 14 machines produced and designed with suppliers
- Designed for educational purpose
- Full manufacturing process of machine

Completion time

8 months

PROJECT B

❖ **Over 100 clients over the world**

KeepMOTION

DESIGN, OPTIMIZATION AND PRODUCTION OF ROTATING ELECTRICS, MOTORS, ALTERNATORS AND ELECTROMECHANICAL ACTUATORS

keep-motion.com