

# Shape optimization of a SRM

## 2D Application Note Summary

### Introduction

The example carries out the shape optimization of a synchronous reluctance machine (SRM). Mean torque, calculated using an Altair Compose code, will be optimized.

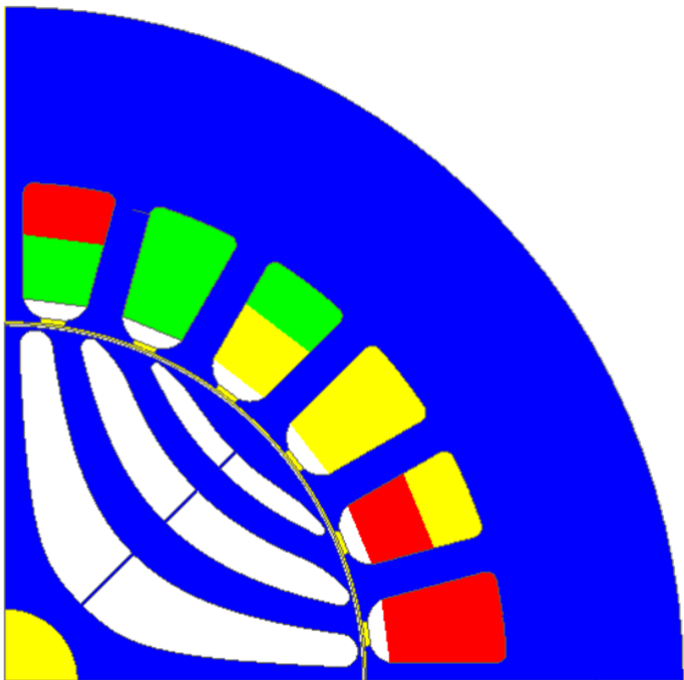
The initial geometry of the SRM is imported from a STEP file. Three different shape optimizations will be presented: without constrains, imposing a rotor mass decrease of 20% and imposing this same mass reduction and rotor’s symmetry.

### Keywords

Applications	Features used	Computed quantities
<ul style="list-style-type: none"><li>• Magneto Static 2D</li></ul>	<ul style="list-style-type: none"><li>• Import CAD file</li><li>• Shape optimization through OptiStruct coupling</li></ul>	<ul style="list-style-type: none"><li>• SRM torque</li><li>• Rotor mass</li></ul>

### Studied device

The following picture shows the device to be optimized with Flux 2D:



## Studied cases

The document presents the following three cases:

- Case 1: Shape optimization of the mean torque using optimization function programmed in Altair Compose file. No optimization constrains are applied.
- Case 2: A similar shape optimization of the torque will be carried out. In this case a rotor mass reduction  $> 20\%$  will be imposed.
- Case 3: Shape optimization of the torque fulfilling two constrains: Rotor symmetry and a reduction mass of the rotor  $> 20\%$ .

## Analysis of results

Magnetic results can be analyzed in the Flux supervisor example. The candidate machine proposed in each optimization step, and the overall evolution of the optimization process can be visualized in Altair HyperView.

