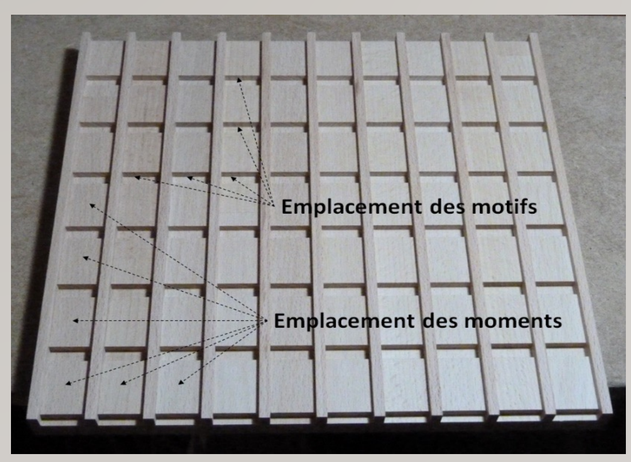
MAGAME

Understand the magnetisation of a material by playing!

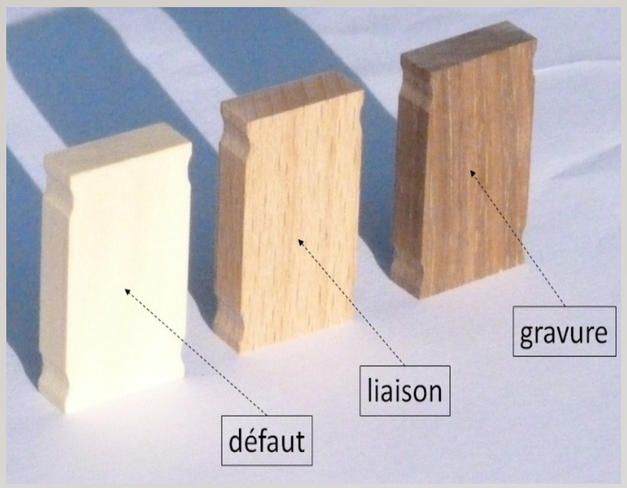
ESSIAL is a research project funded by the European Commission. Its ambition is to develop tailor-made processes to improve the performance and functionality of ferromagnetic steels in order to reduce their energy consumption and magnetic core noise, while facilitating recycling and reducing overall cost.

The game



Polarizable material = easily magnetised or demagnetised

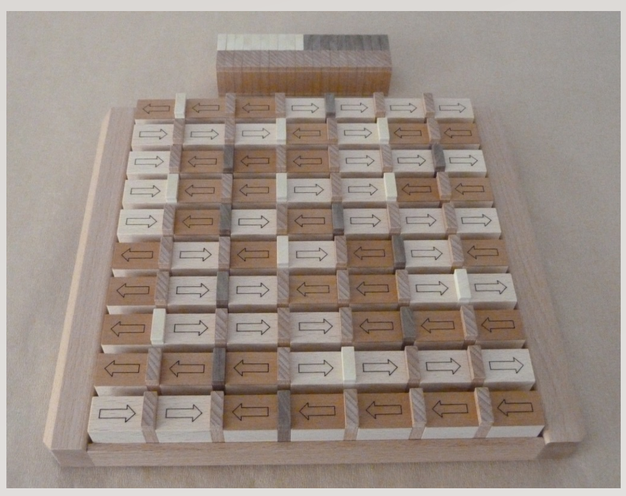
Exposing ferromagnetic materials to radiation to change their properties



Irradiation → default

Etching →

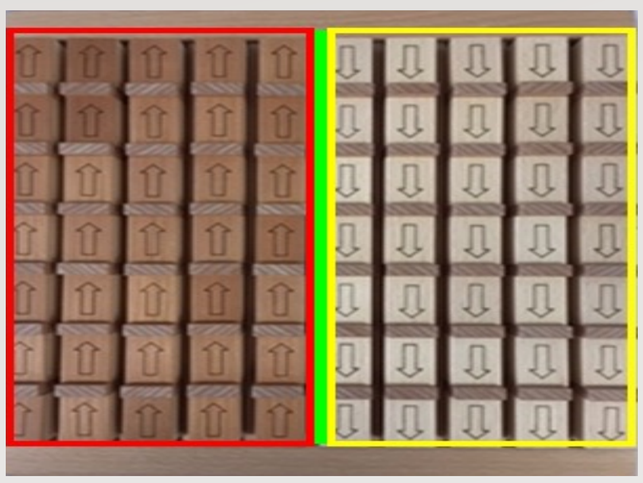
Ablation → untie



Magnets = Magnetic moments

Brown domain up ←

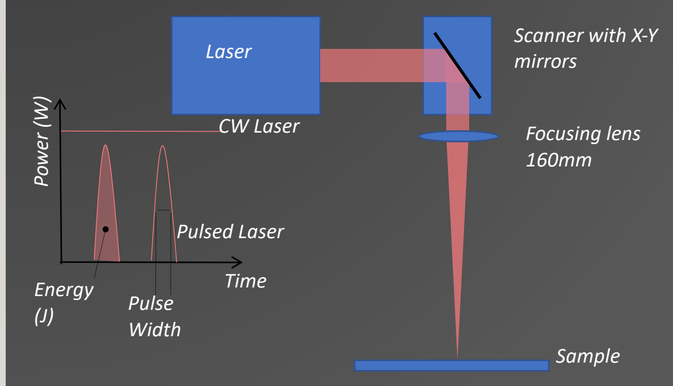
Beige domain down →

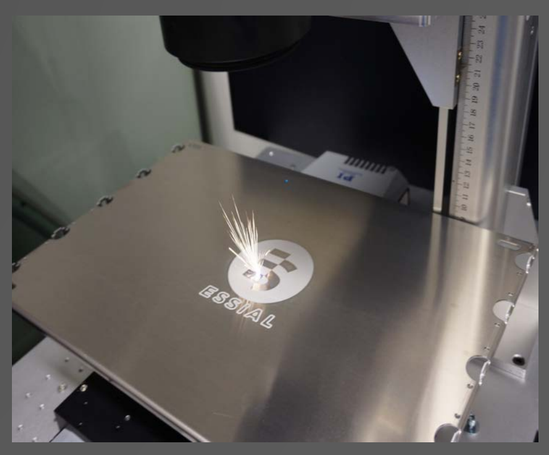


Walls = Boundary between domains

Magnetization = Polarisation = Turning over magnets = Movement of walls

The project



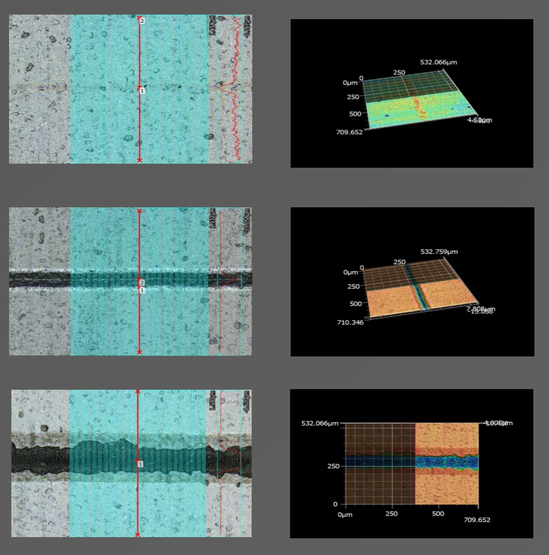


Laser treatments

Inducing constraints

Etching

Removing material

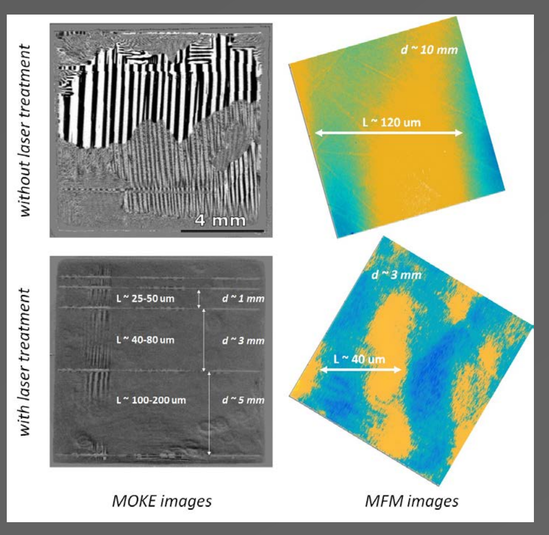


How to characterise polarisation or magnetisation?

Provide continuity in magnetized material

Region of a material in which the magnetic moments are oriented in the same direction

Moments pointing in the opposite direction

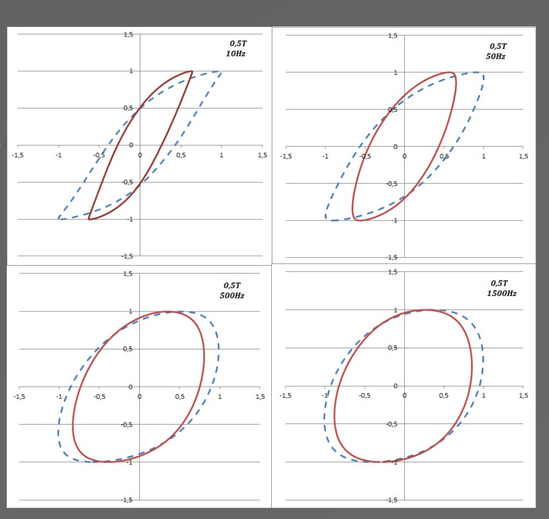


Magnetisation mechanisms

Transition zone between two different magnetisation domains

Mechanism of magnetisation and demagnetisation by displacement of the magnetic walls

Magnetisation and demagnetisation cycles of materials



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