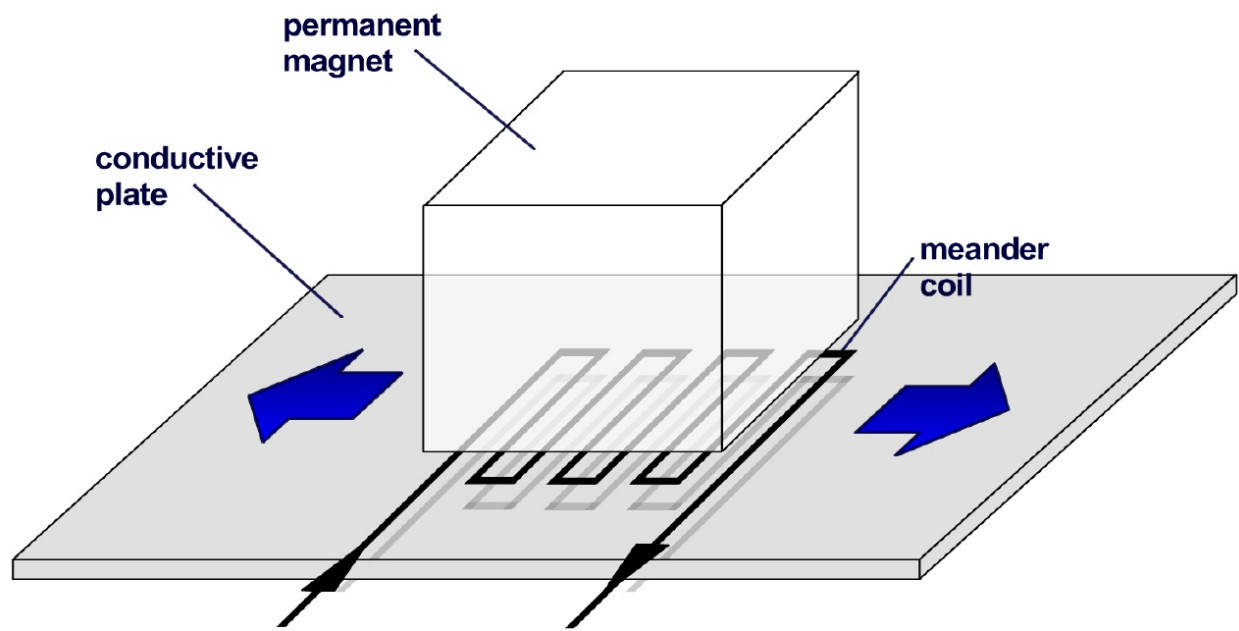
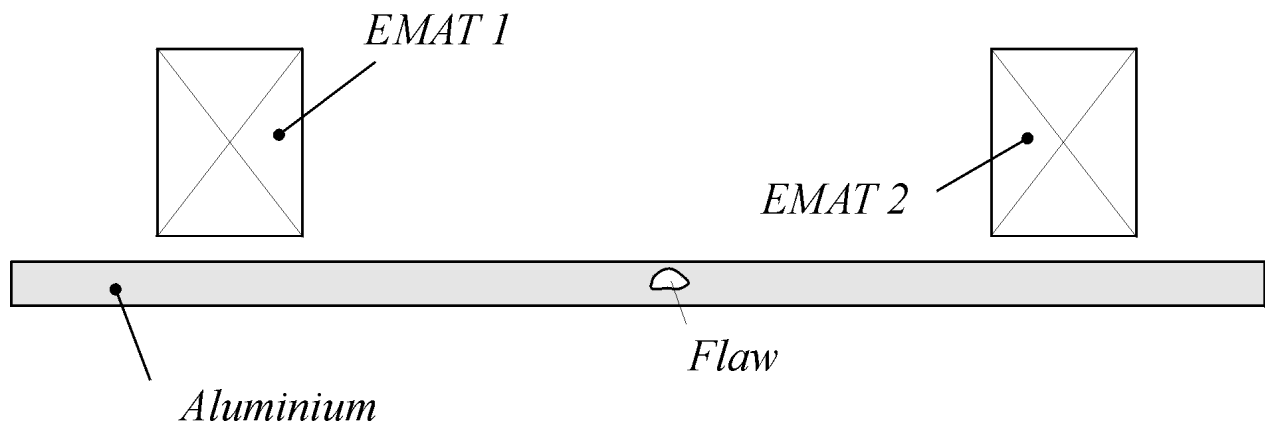


Transient Simulation of an EMAT

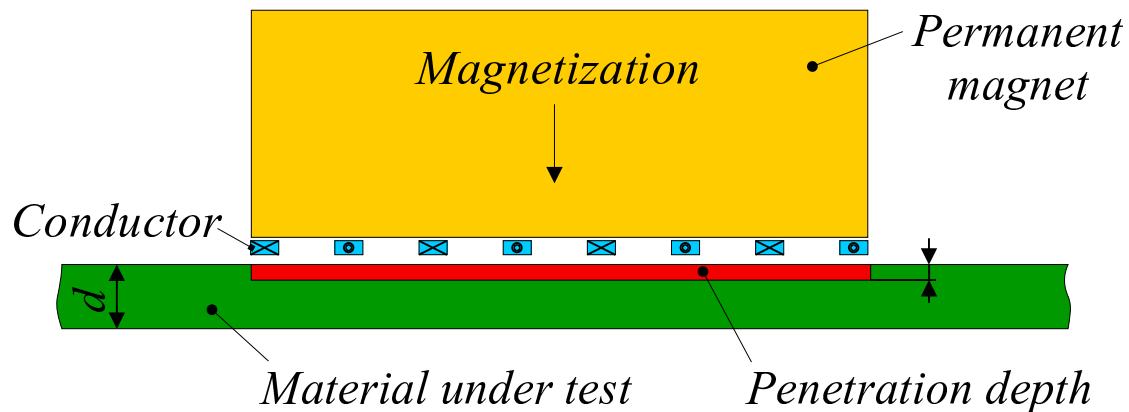
Setup for plate wave generation



Quality control of rolled aluminium



2D Simulation Model of the Transmitting EMAT



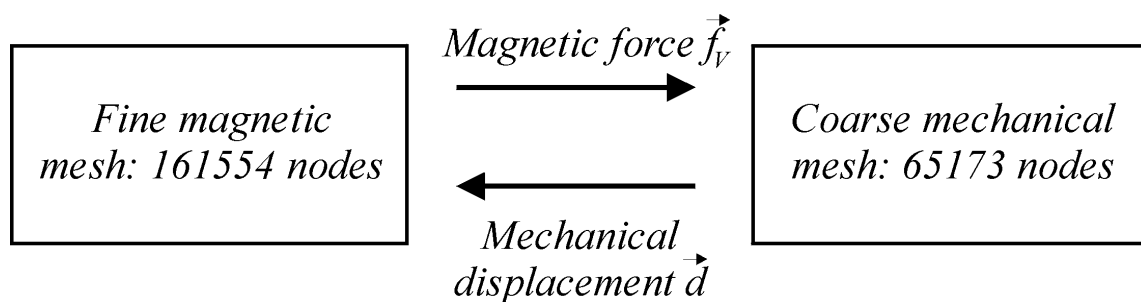
Penetration depth (Aluminium, $f=1.8$ MHz):

$$\delta = \frac{1}{\sqrt{\pi \gamma_{Alu} \mu_{Alu} f}} = 63.4 \mu m$$

Mechanical wavelength:

$$\lambda_{mech} = \frac{c_{mech}}{f} = 1667 \mu m$$

→ Different FE grids for the mechanical and the magnetic field problem



Problems in this simulation

Penetration depth
= 63.4 m

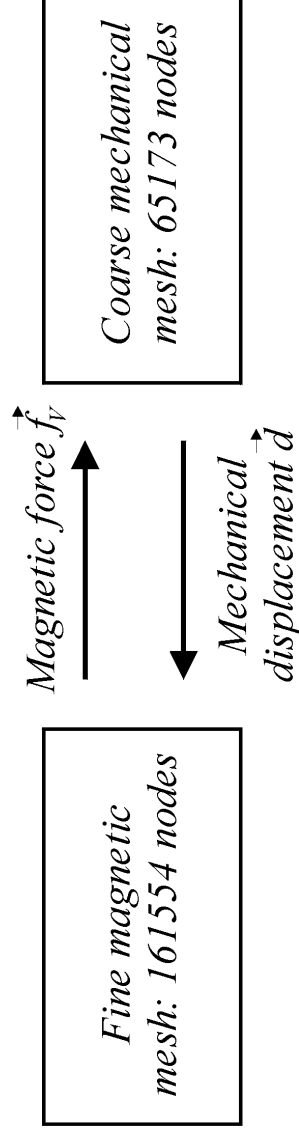
vs.

Mechanical wavelength
1667 m = _{mech}



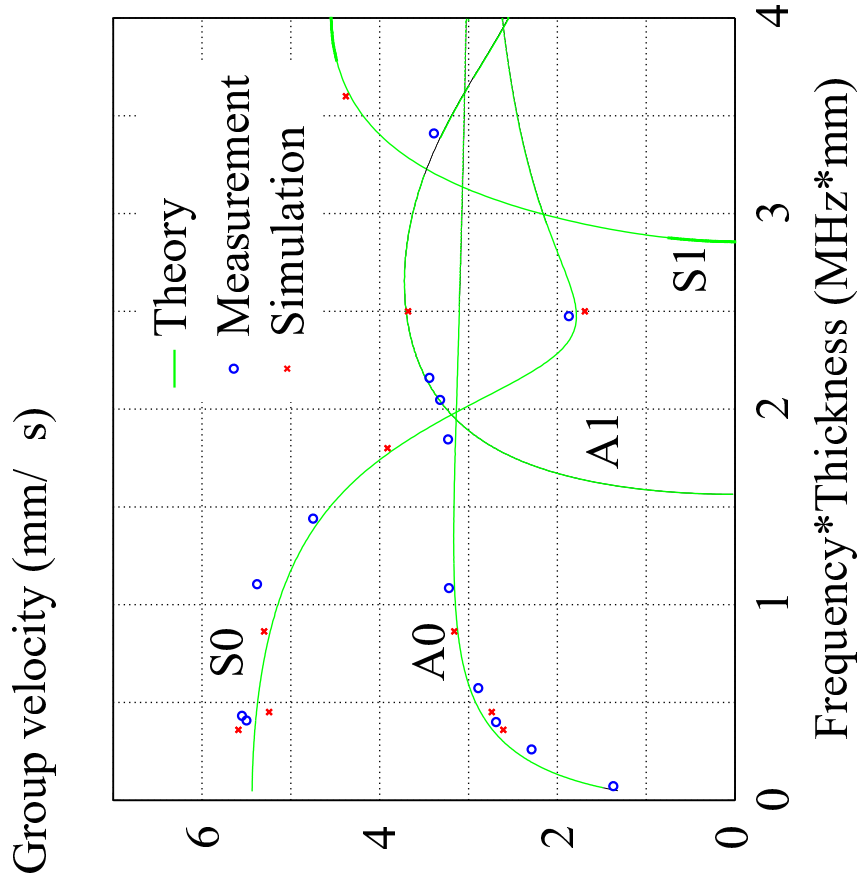
Solution with our software

Different FE grids for the mechanical and the magnetic field problem



Comparison Measurement-Simulation

Group Velocity in the Plate



Normalized Received Voltage

