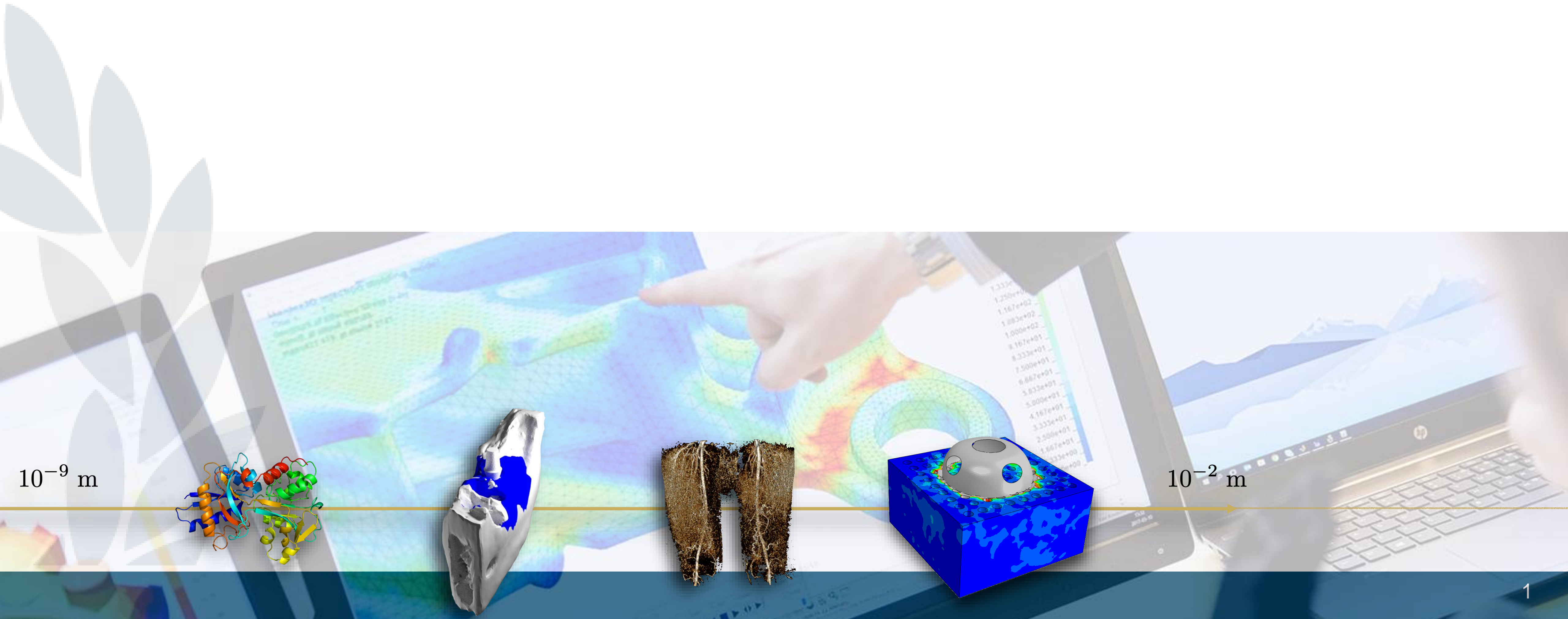




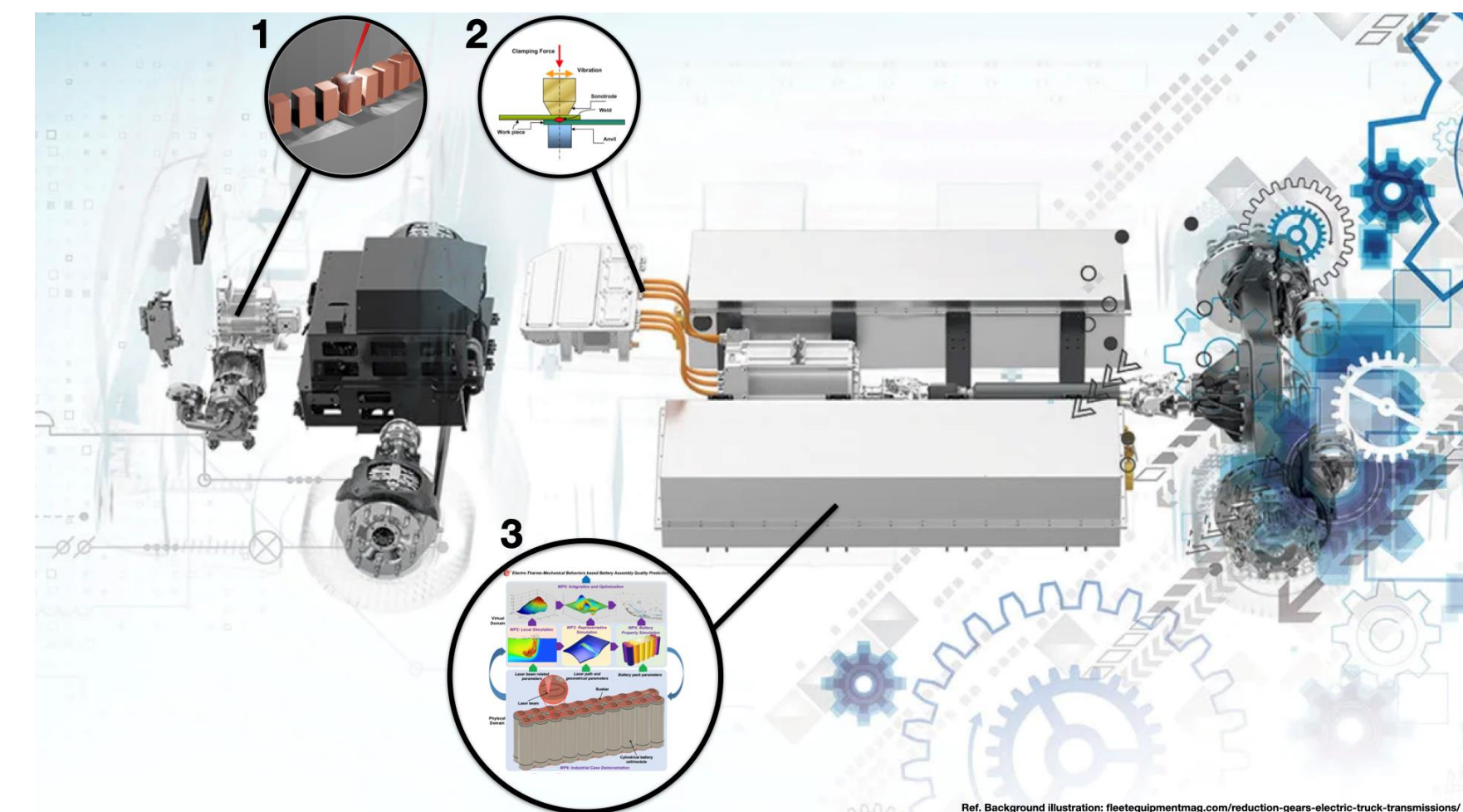
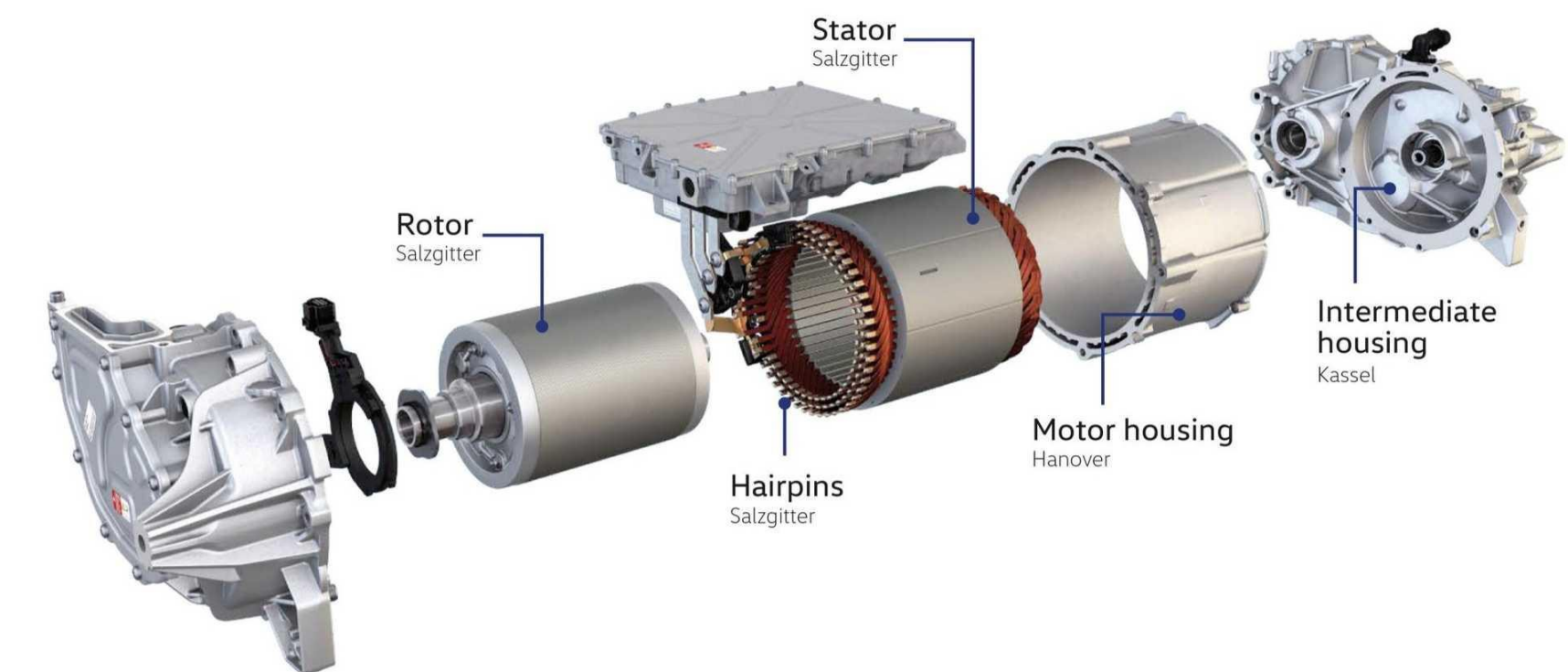
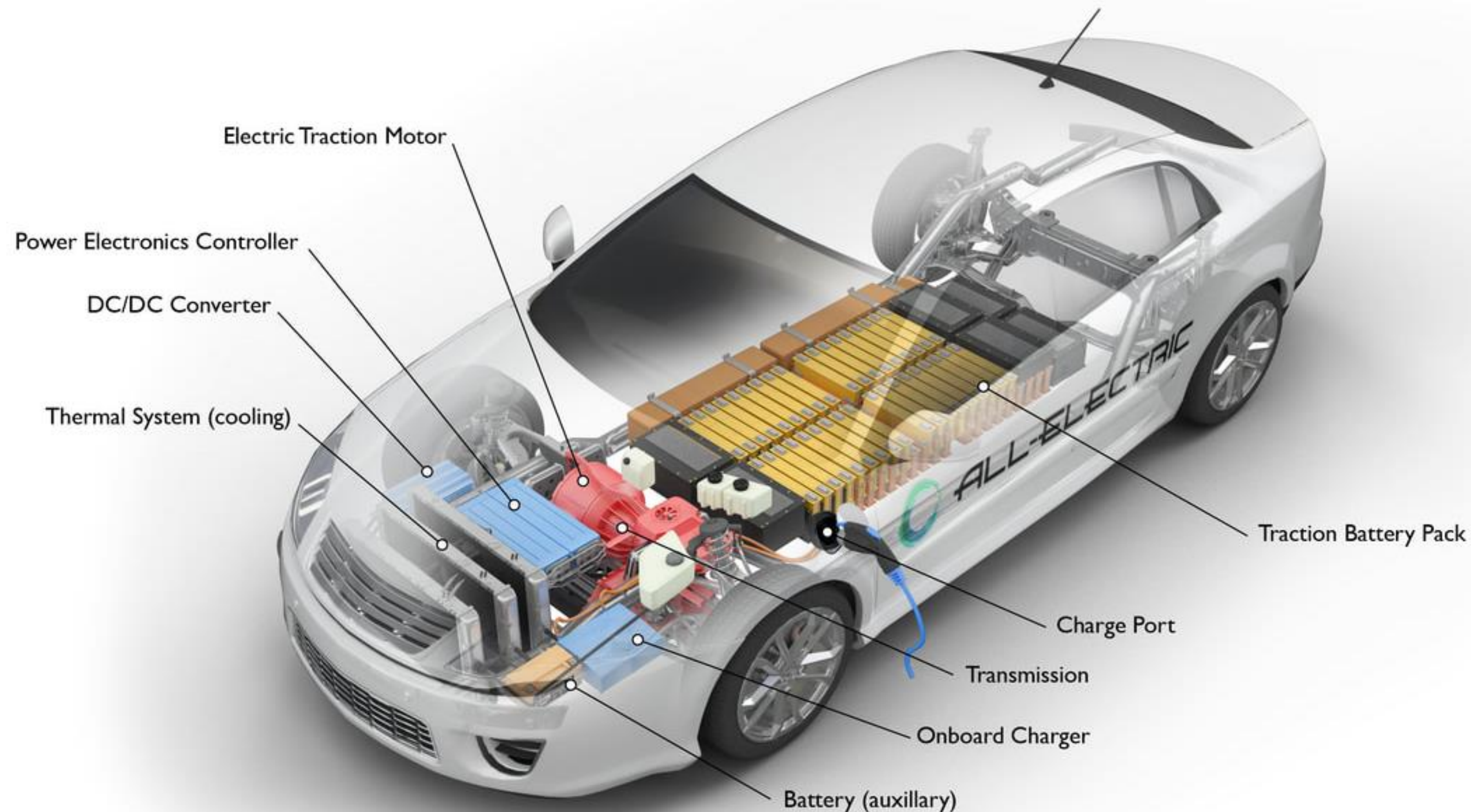
VMP

- Forskning inom nästa generations drivlinor



Batteridrivna elfordon

Elektromobilitet (eller e-mobilitet) representerar konceptet att använda elektriska drivlinor, informations- och kommunikationsteknik i fordon samt tillhörande infrastruktur för att möjliggöra elektrisk framdrivning av fordon.



Forskningsfokus inom VMP

1. Elmotorn

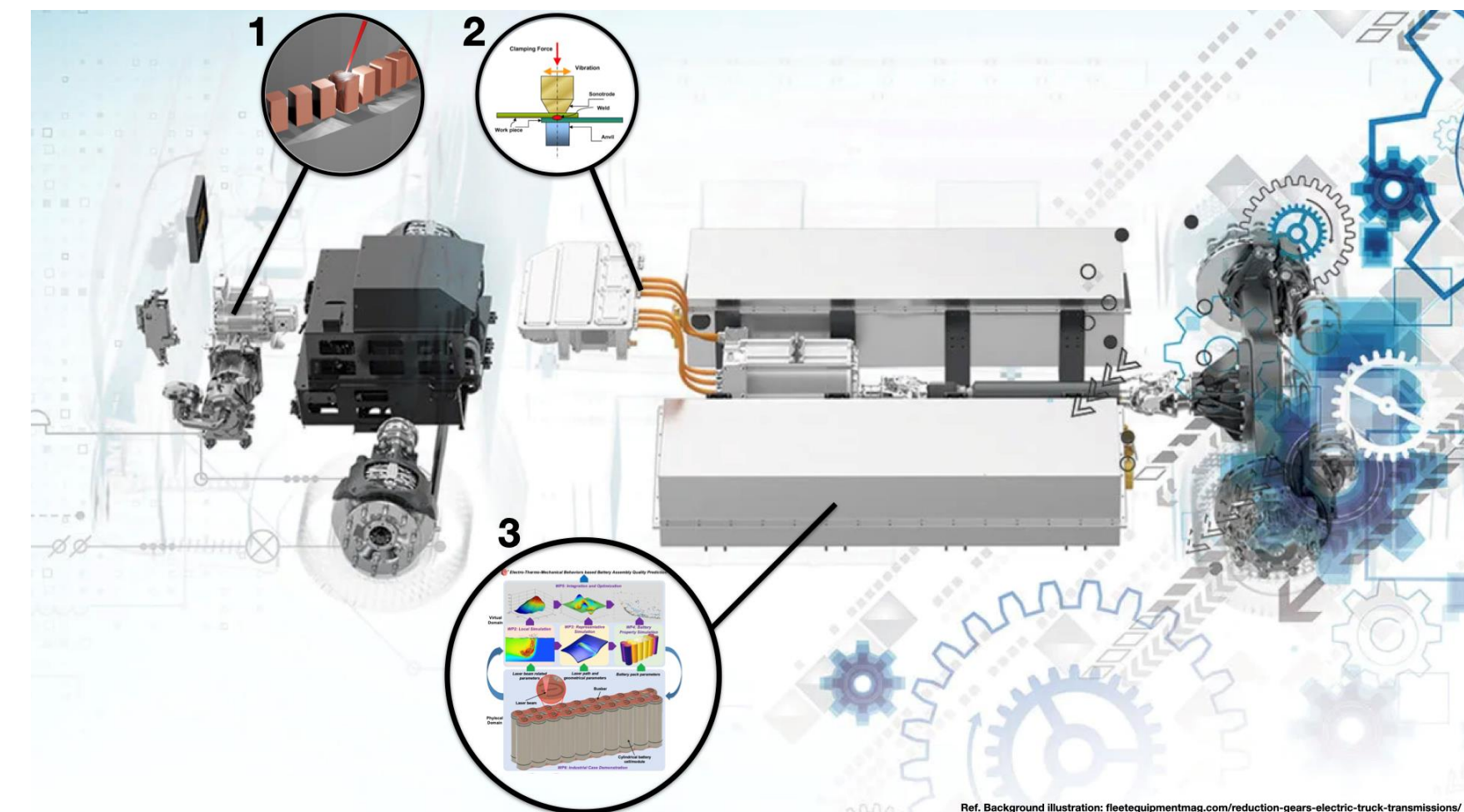
- Lasersvetsning av hairpins
- Bearbetning av tunna lättmetallegeringar
- Gjutning av komponenter

2. Inverter

- Laser- och ultraljudssvetning av strömkablar

3. Batterier

- Optimering av lasersvetsning Busbar/Battery tab
- Formsprutade fixeringskomponenter (inom kort)



Elmotorn

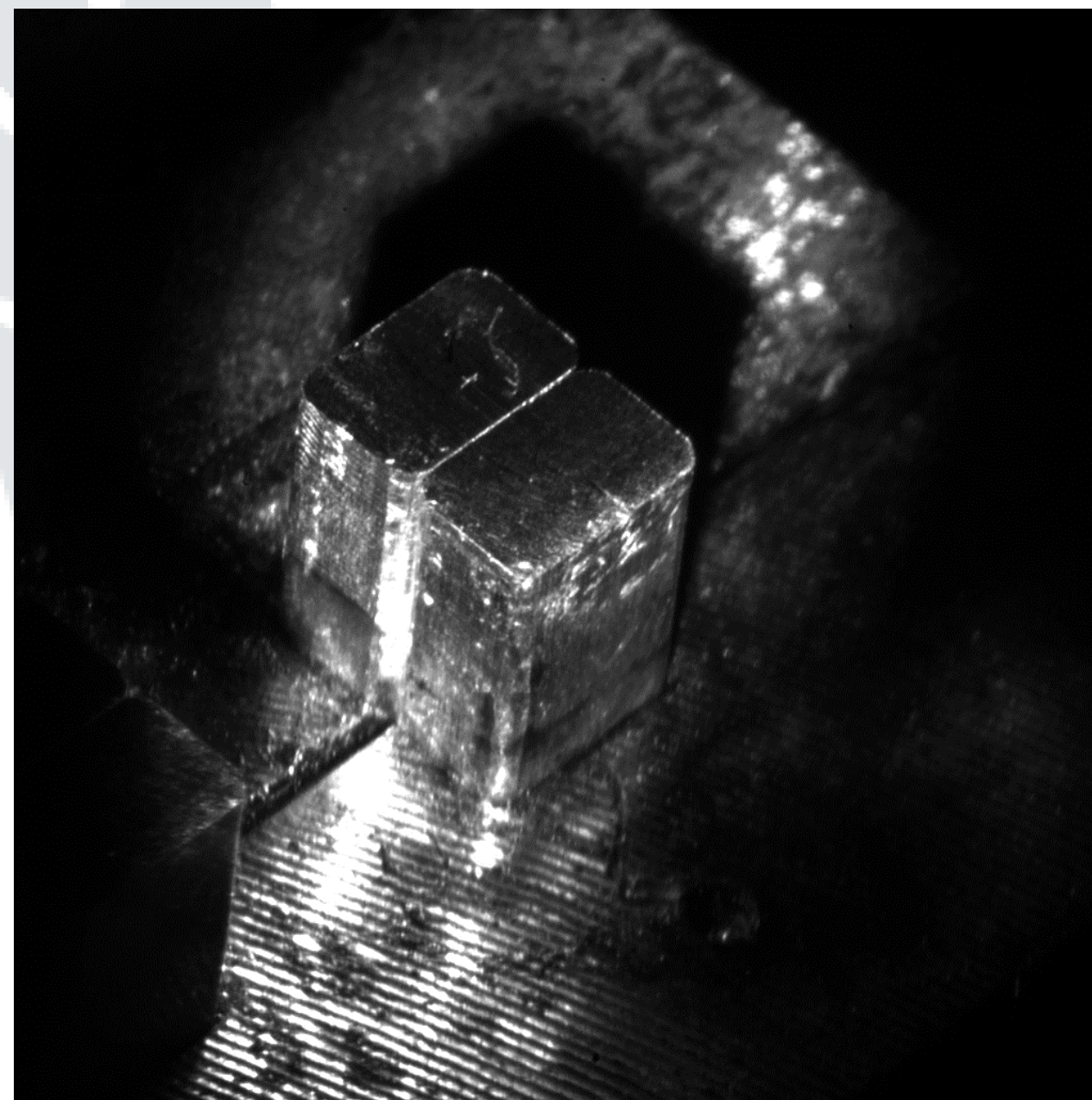
Exempel

$P = 5000W$

$v = 500 \text{ mm/s}$

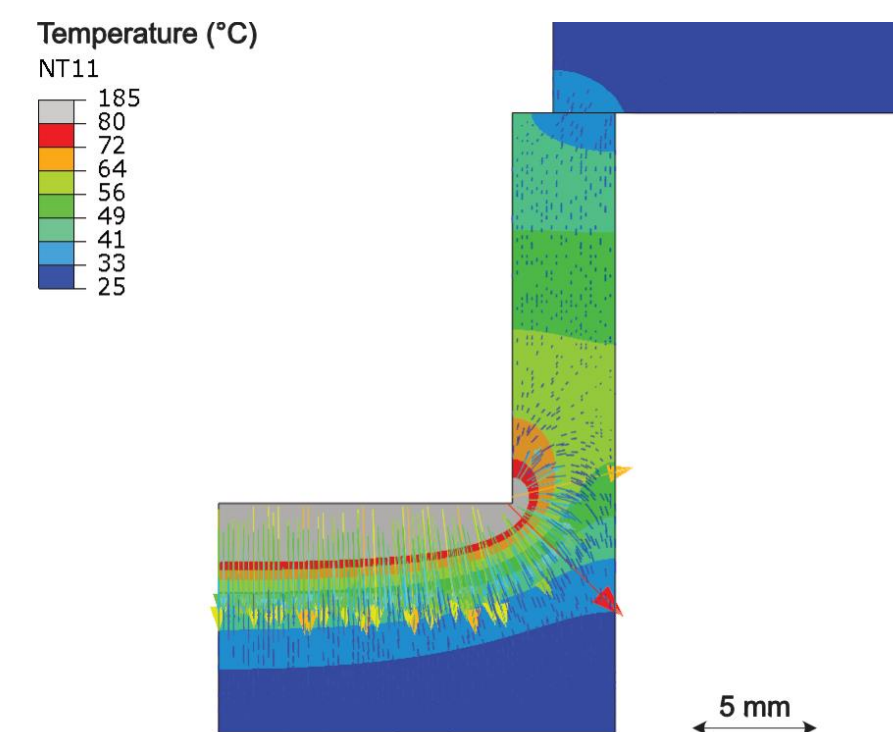
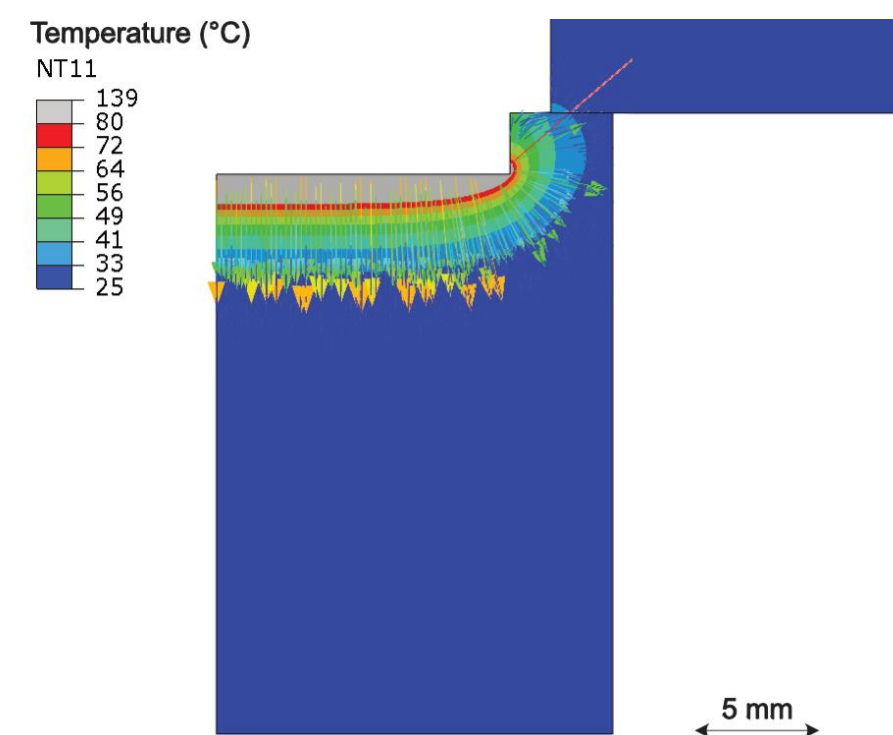
$n = 11 \text{ rep}$

3x3mm ellipse



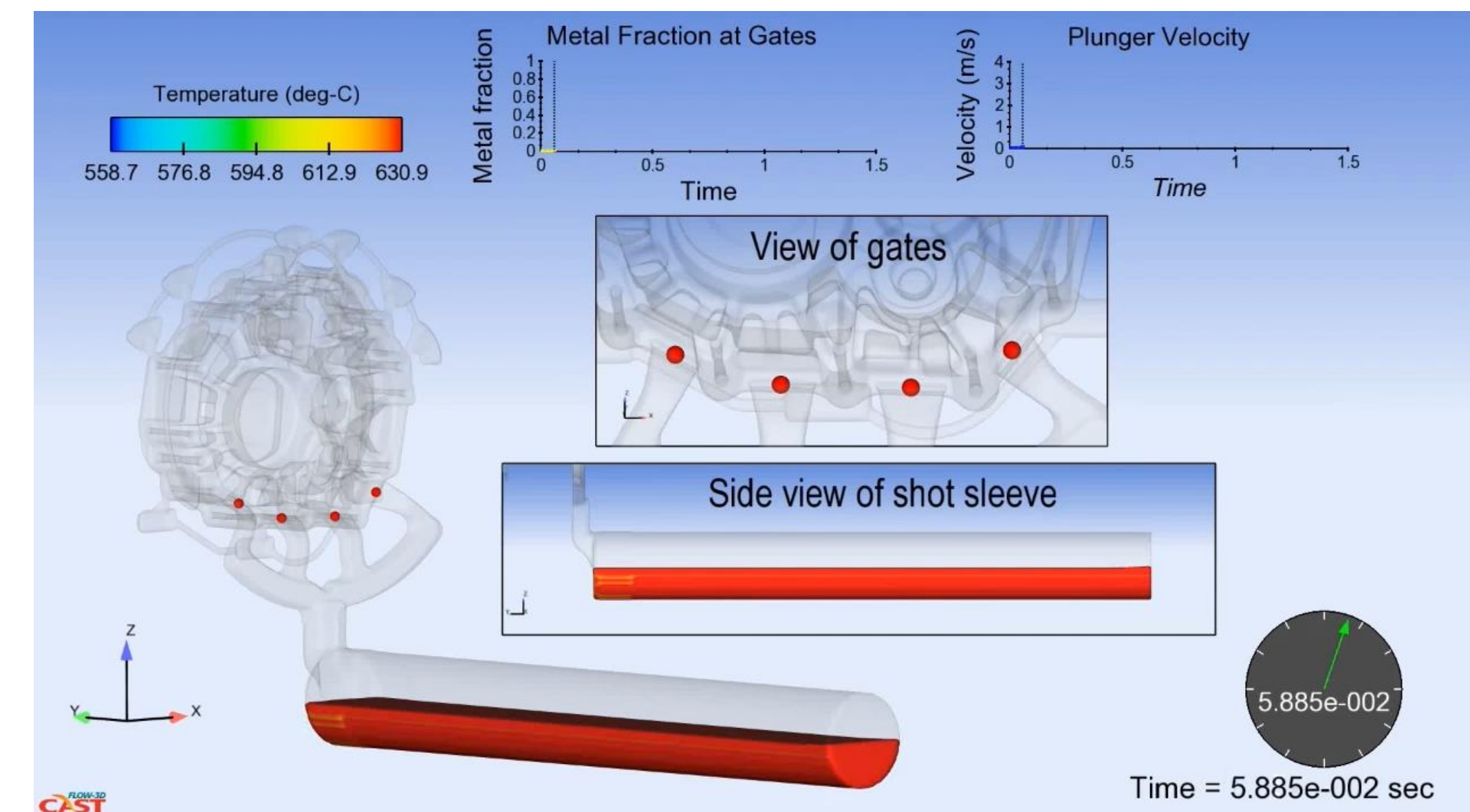
Exempel

Arborning

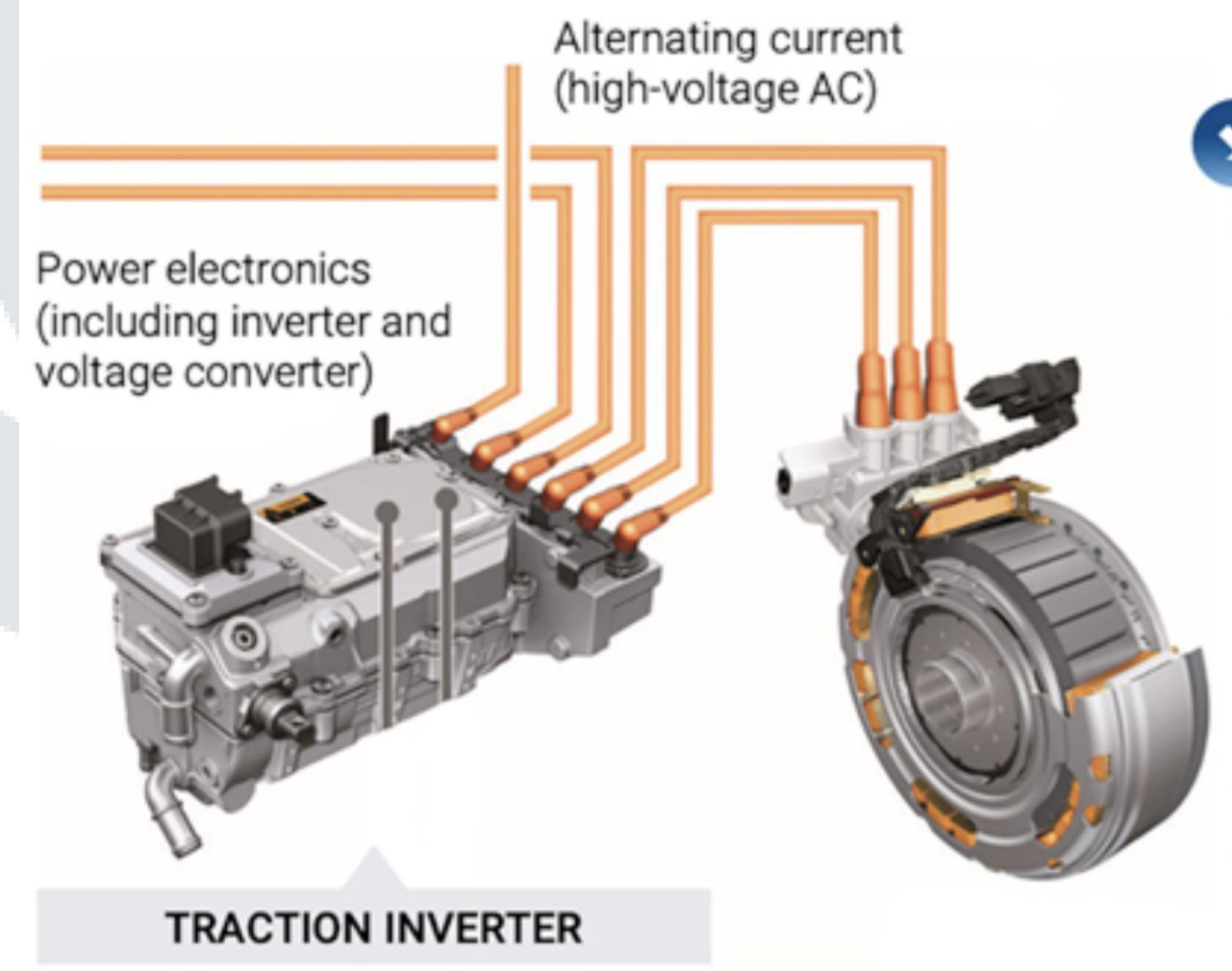


Exempel

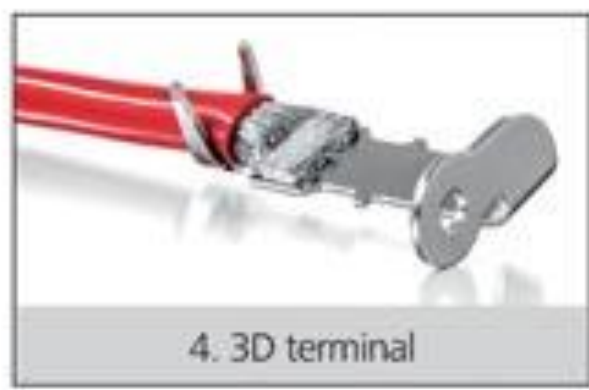
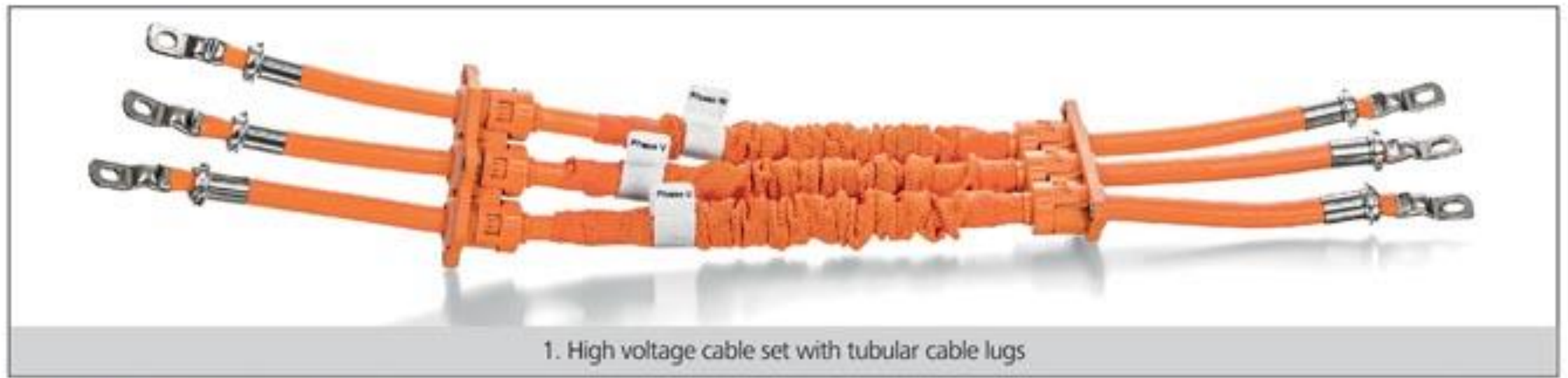
HPDC av statorhuskomponent



Inverter

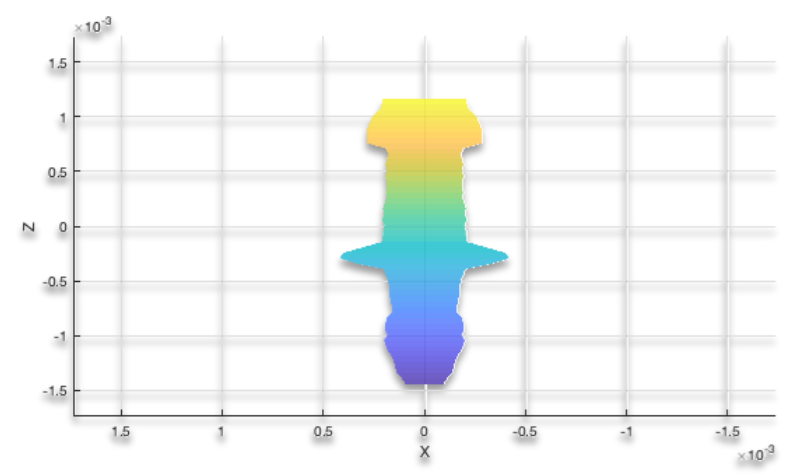
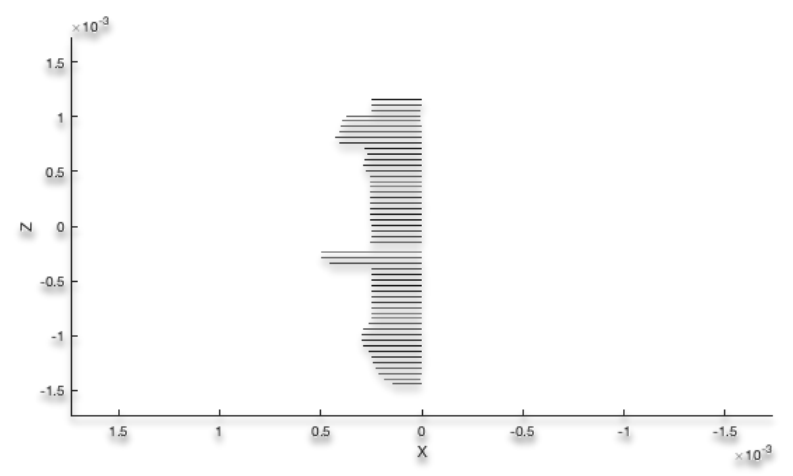
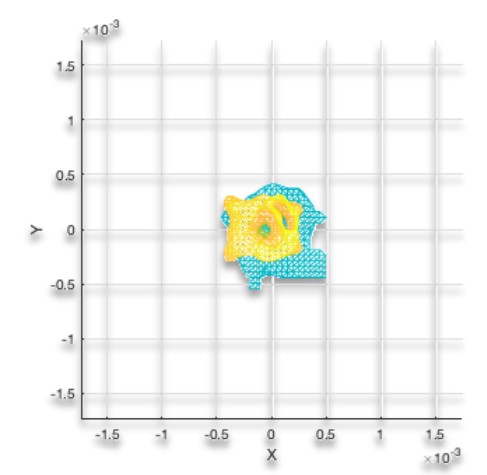
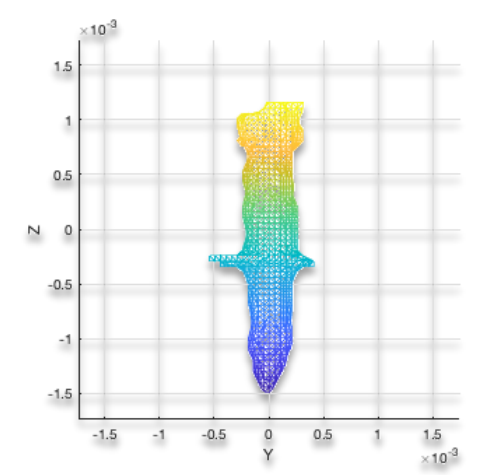
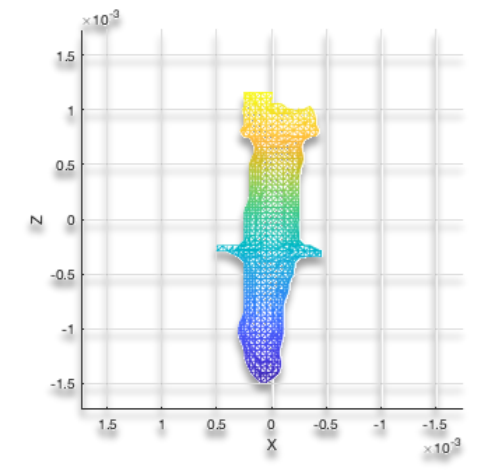
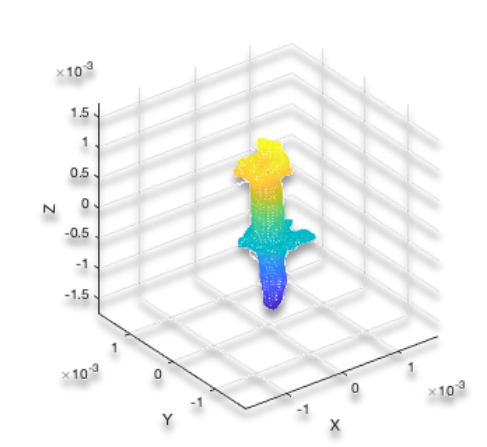
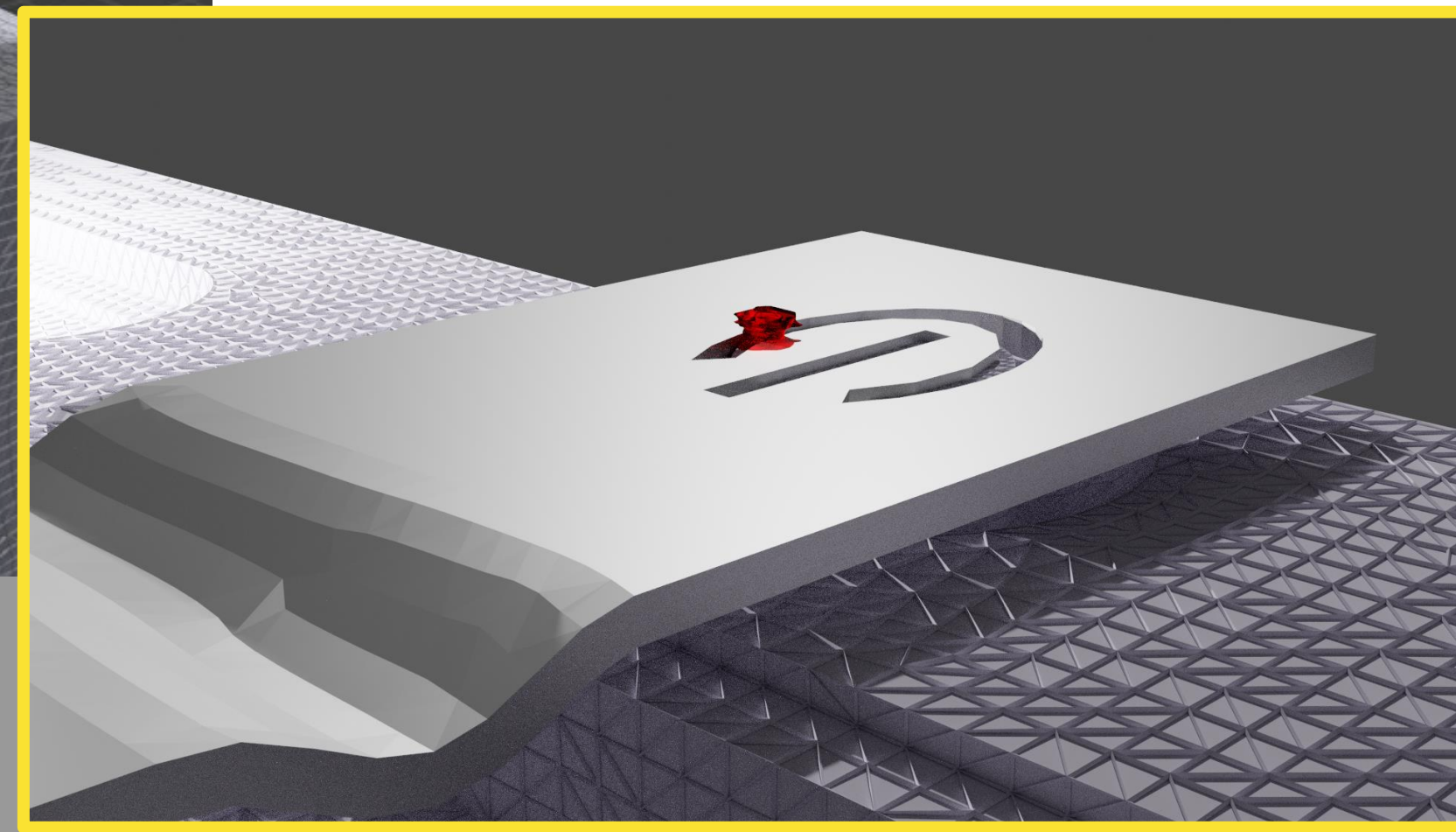
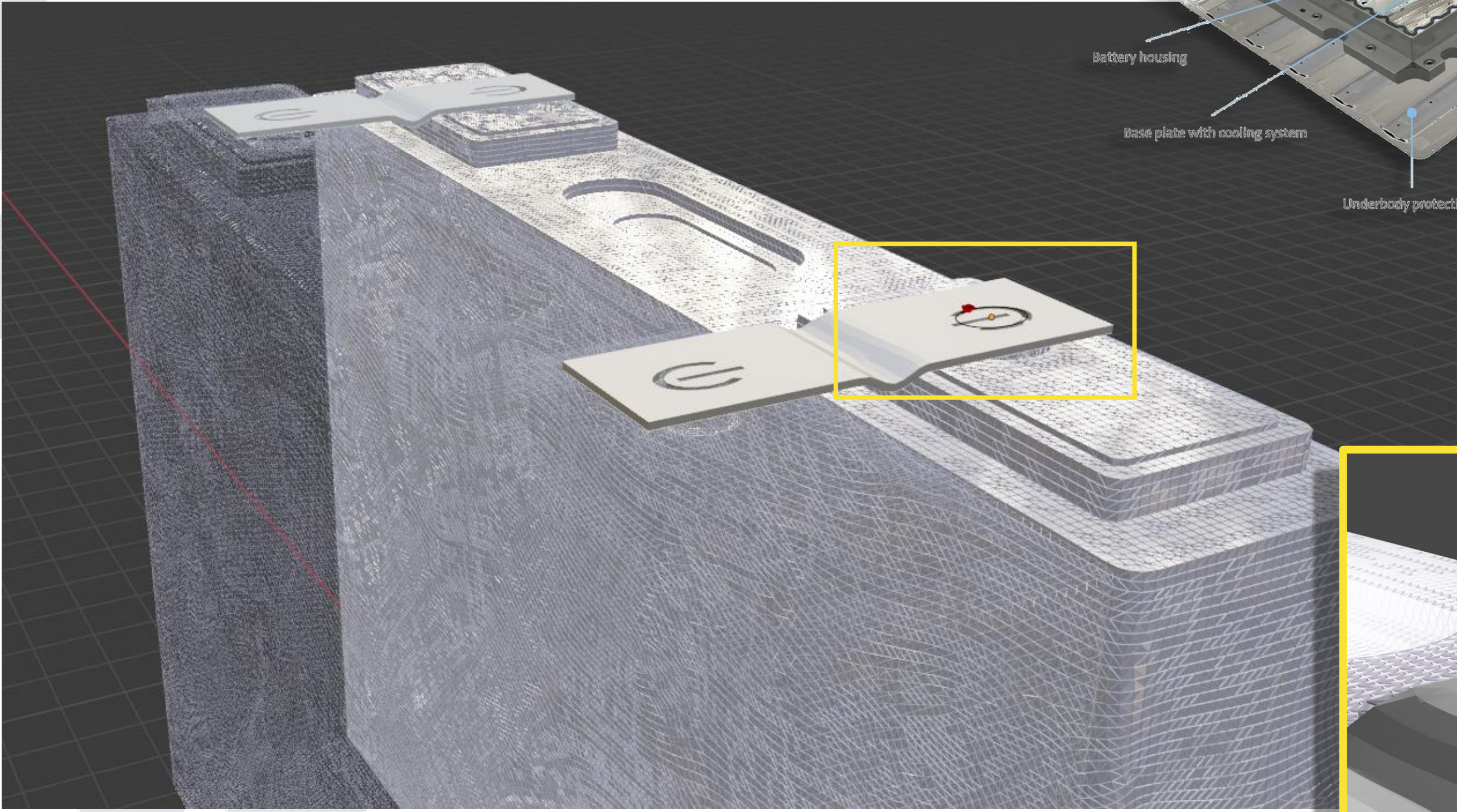
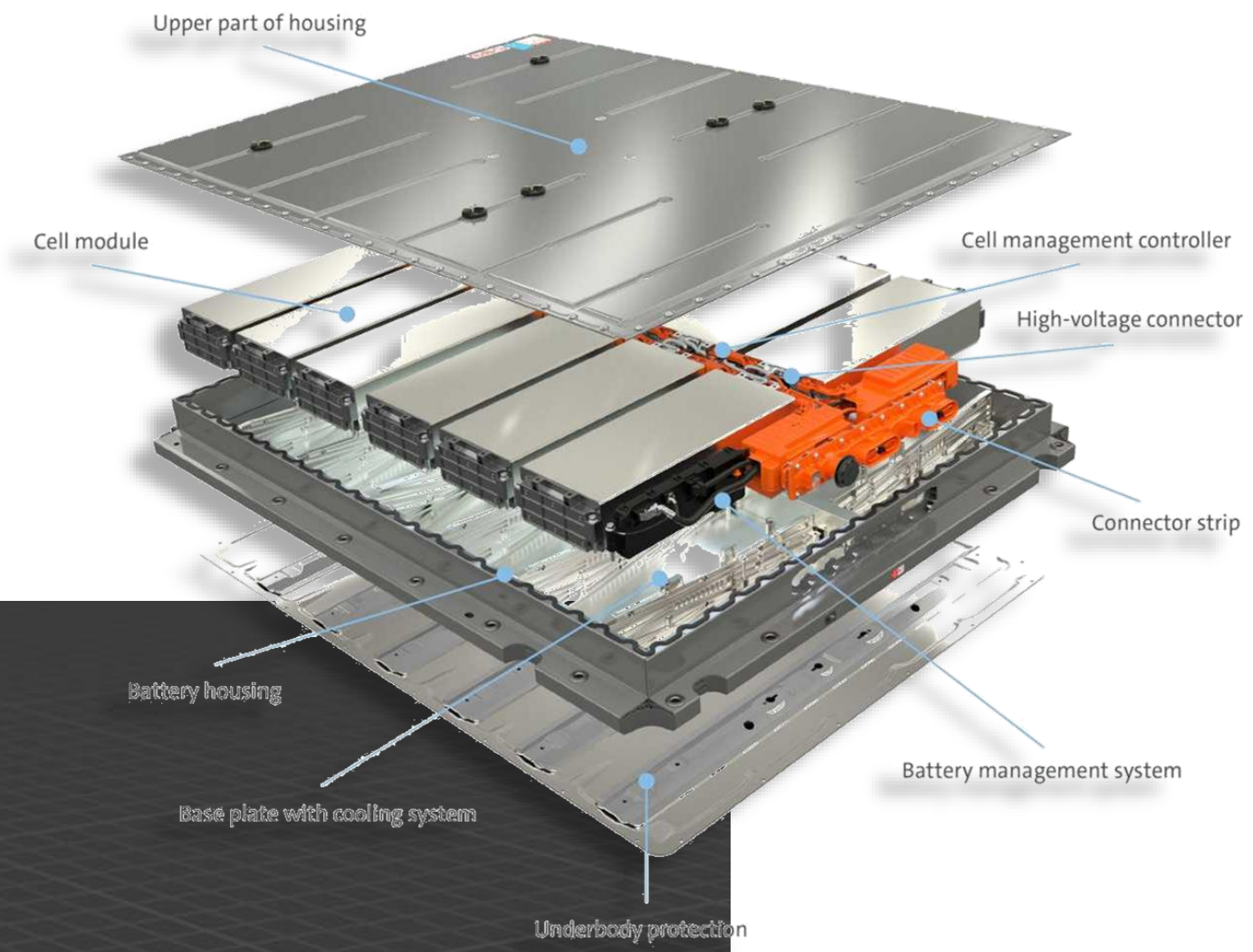


	Plug-In-Hybrid	BEV
Voltage Level	300-450V	300-900V
Electric Motor	60-120kW	> 150kW
Electric Driving Range	~50 km	> 200km



Ref: "Why Europe can secure enough critical raw materials", [Online]. Available: <https://is.gd/cYOOsl> [Access 06-01-2022].

Batterier



Overview - VMP research areas

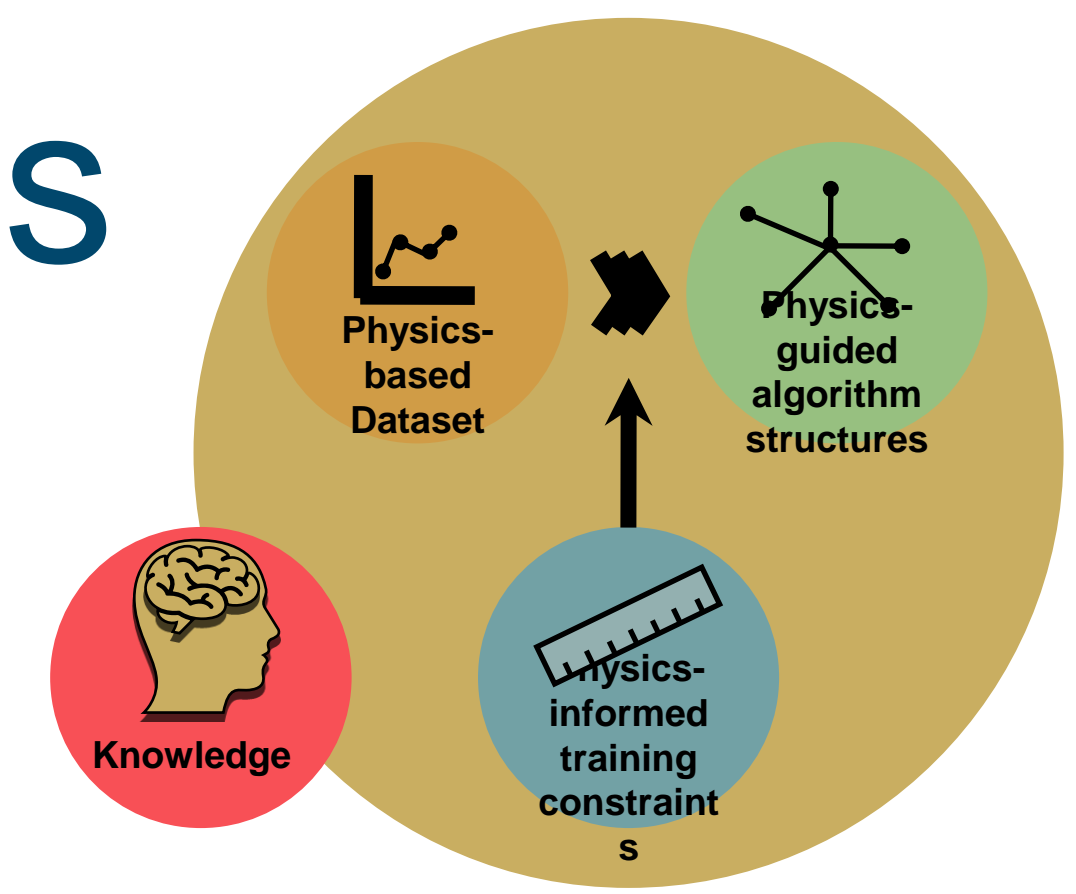
Machining: Focus on machining of thin-walled components for electric motors such as the stator housing

Laser welding: Focus on laser welding of so-called hairpins for the stator and busbars/connectors for assembling of batteries

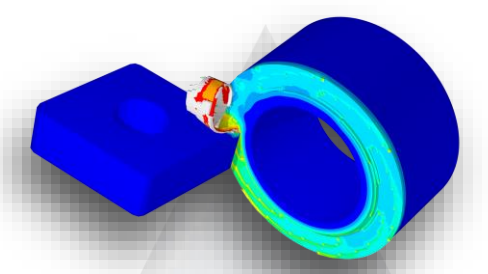
Injection molding: Focus on structural integrity and stability in the context of NVH for various components in electric drivelines

Topology optimization: Focus on topology optimization to reduce weight and sustainable material usage for various components in electric drivelines

Data driven analytics: Focus on analysis of sensor data to control manufacturing process parameters

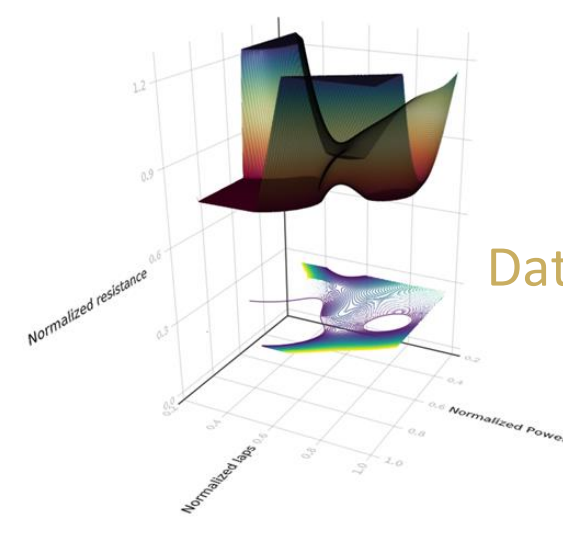


Virtual Process Modeling



VMP | VIRTUAL MANUFACTURING PROCESSES
VIRTUAL ENGINEERING

- Virtual Manufacturing Processes allows for the development of digital twins that can be used to study and analyze products, phenomena or other items of interest with high accuracy and detail in a virtual reality before they have even been produced.
- This approach reduce costs, increase sustainability and allow for optimized solutions.



Data Driven Analytics

Experimental Validation

