Instituto Universitario de Investigación en Ingeniería de Aragón
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XI JORNADA DE JÓVENES INVESTIGADORES DEL I3A

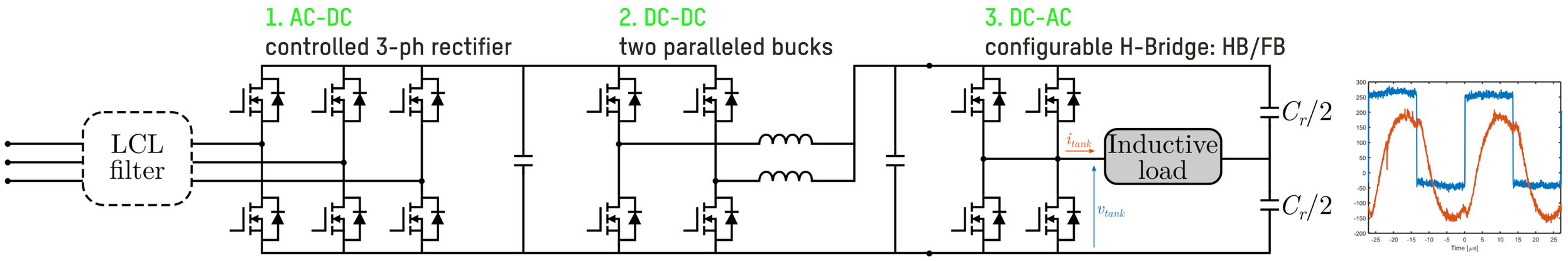
SiC Based Power Converter for Industrial Induction Hardening of Steel Probes

A. Mendi-Altube[1,2], I. Villar[1], C. Carretero[2] y J. Acero[2]
[1]Ikerlan Technology Research Centre, Basque Research and Technology Alliance (BRTA), Arrasate-Mondragon, Spain
[2]Instituto de Investigación en Ingeniería de Aragón I3A, Universidad de Zaragoza, 50018 Zaragoza, Spain

IH systems are: [1]
- ✓ Quick
- ✓ Durable
- ✓ Easy to control
- ✓ Efficient

-**Power converters adapt the mains' frequency** to the frequency required by the process.
-Many power electronics **topologies** are used in IH systems [2,3].
-Most of the IH converters make use of **resonant circuits** [4].

➡ A **versatile power converter** for testing **high variety of IH processes** is presented in this work.



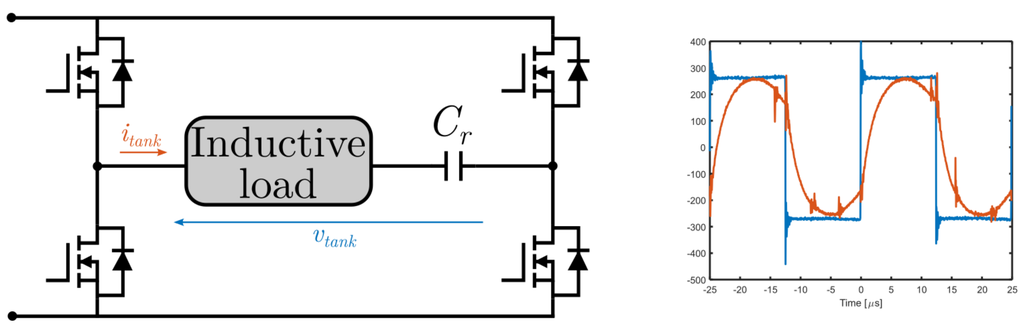
- Main function: convert the mains voltage into a **high frequency current**.

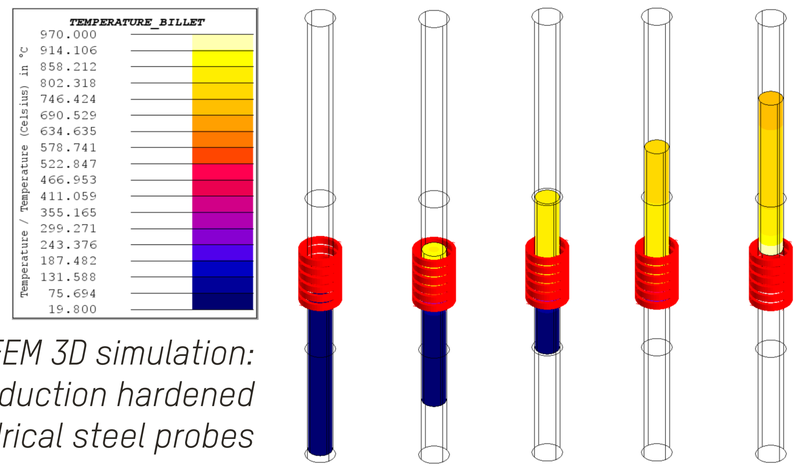
- Divided into **3 stages**:

1. The **3-ph rectifier** generates the **dc voltage up to 650 Vdc**.
2. **DC-DC buck** converters will **further reduce** that voltage.
3. **H-Bridge** inverter to **feed the inductive load**.

- All the semiconductors are based on **SiC technology**.

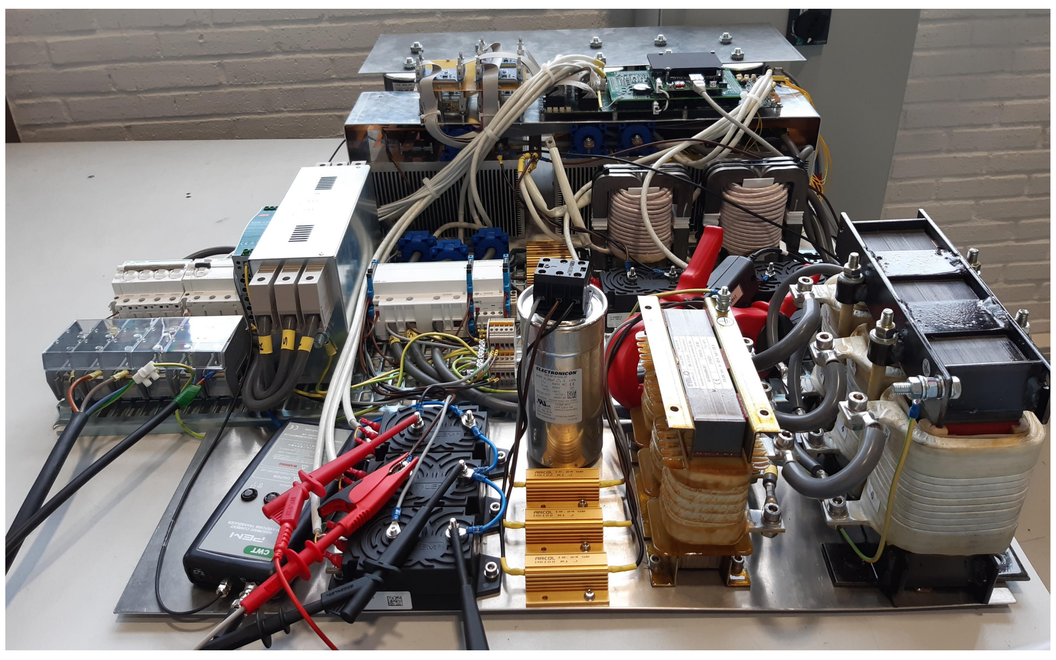
- Main purpose of the prototype: **validate IH models simulated by FEM** tools to investigate new IH processes.





FEM 3D simulation: temperature evolution of induction hardened cylindrical steel probes

Ikerlan's experimental prototype in a table



References

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