Paris Session 2022

SC D1

PS 2 – Q6

How well is the physics of the interfaces in HVDC joints understood? How do we close the gap between small scale laboratory samples and joints installed under real-world conditions?

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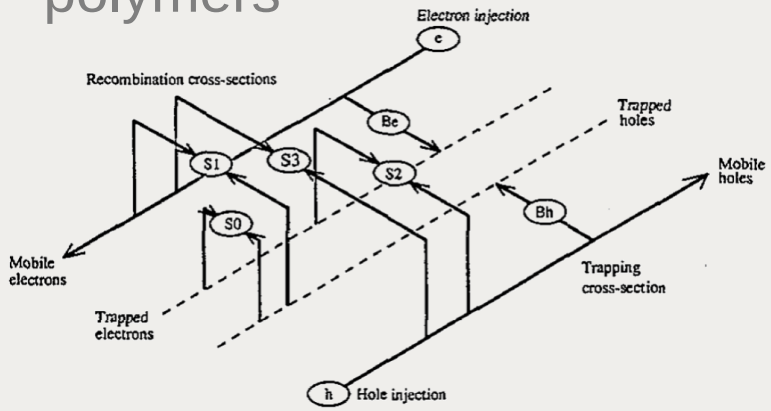
State of the art – How well is the physics of the interfaces in HVDC joints understood?

Macroscopic approach

- Experience from HVAC cable systems
- Taking into account factors described in e.g. TB 210 and TB 476

Microscopic approach

- Developed for modelling space charge distribution in DC-stressed polymers

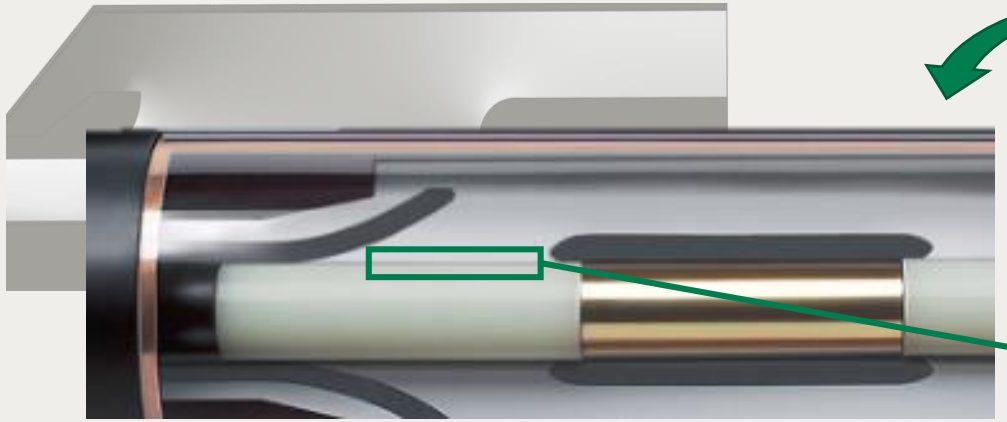


Alison, J. M.; Hill, R. M.: A model for bipolar charge transport, trapping and recombination in degassed crosslinked polyethene, 1994.

Both approaches provide high correlation between experiment and simulation

Next steps – How do we close the gap?

- JWG B1/D1.75 since 2020: *Interaction between cable and accessory materials in HVAC and HVDC applications*
- Combination of macroscopic (full-size joint) and microscopic (laboratory sample) approach: enlargement laws / boundary conditions → co-simulation ?



Vogelsang, R. et al.: Silicone technology for reliable performance of joints and terminations for high voltage polymer power cables, 2011.