

The influence of the energy transition on insulation

An introduction to a starting PhD research project at TU/e and TUD

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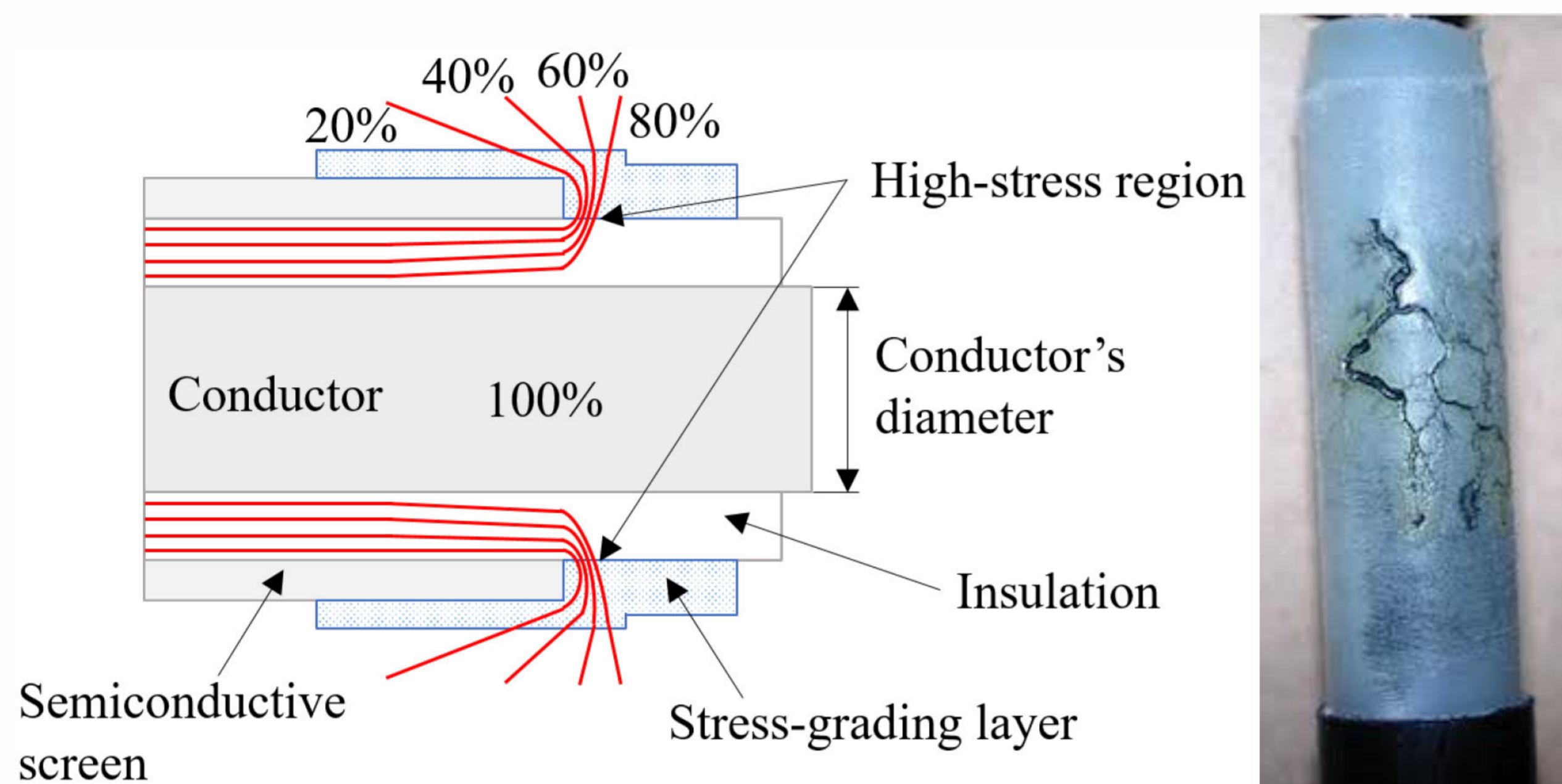
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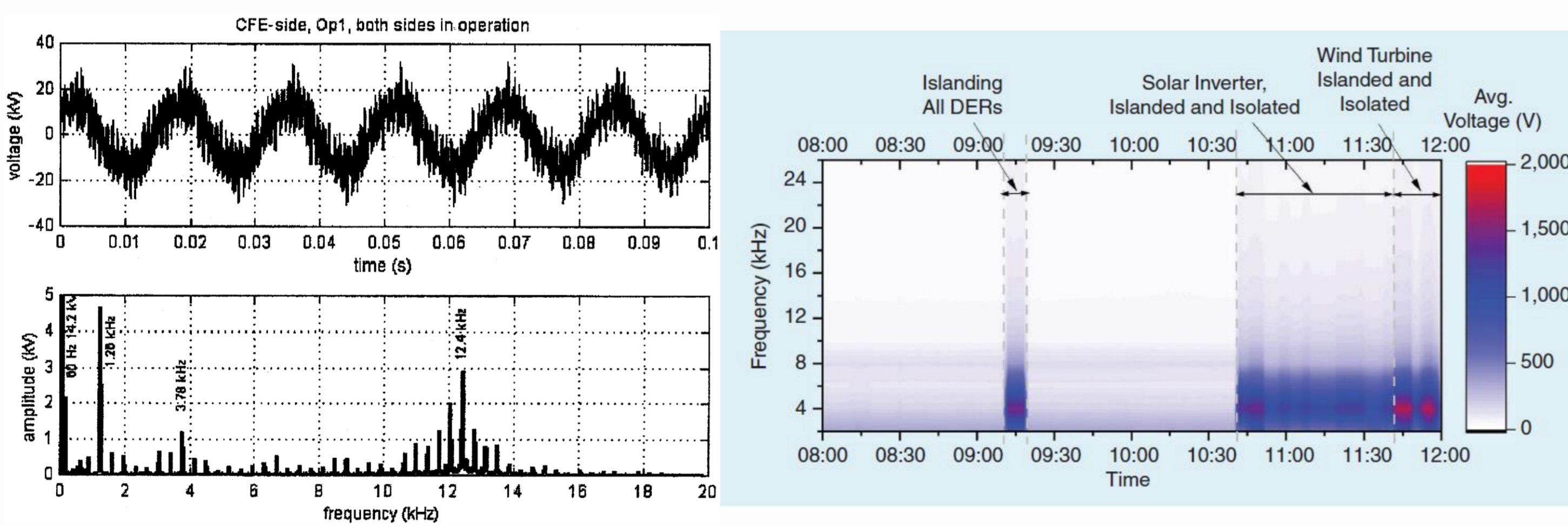
Supra-harmonics due to Energy transition

Power electronics are potentially distorting the power frequency in the range of 2 to 150 kHz. This can degrade the insulation materials of the grid faster than normal.

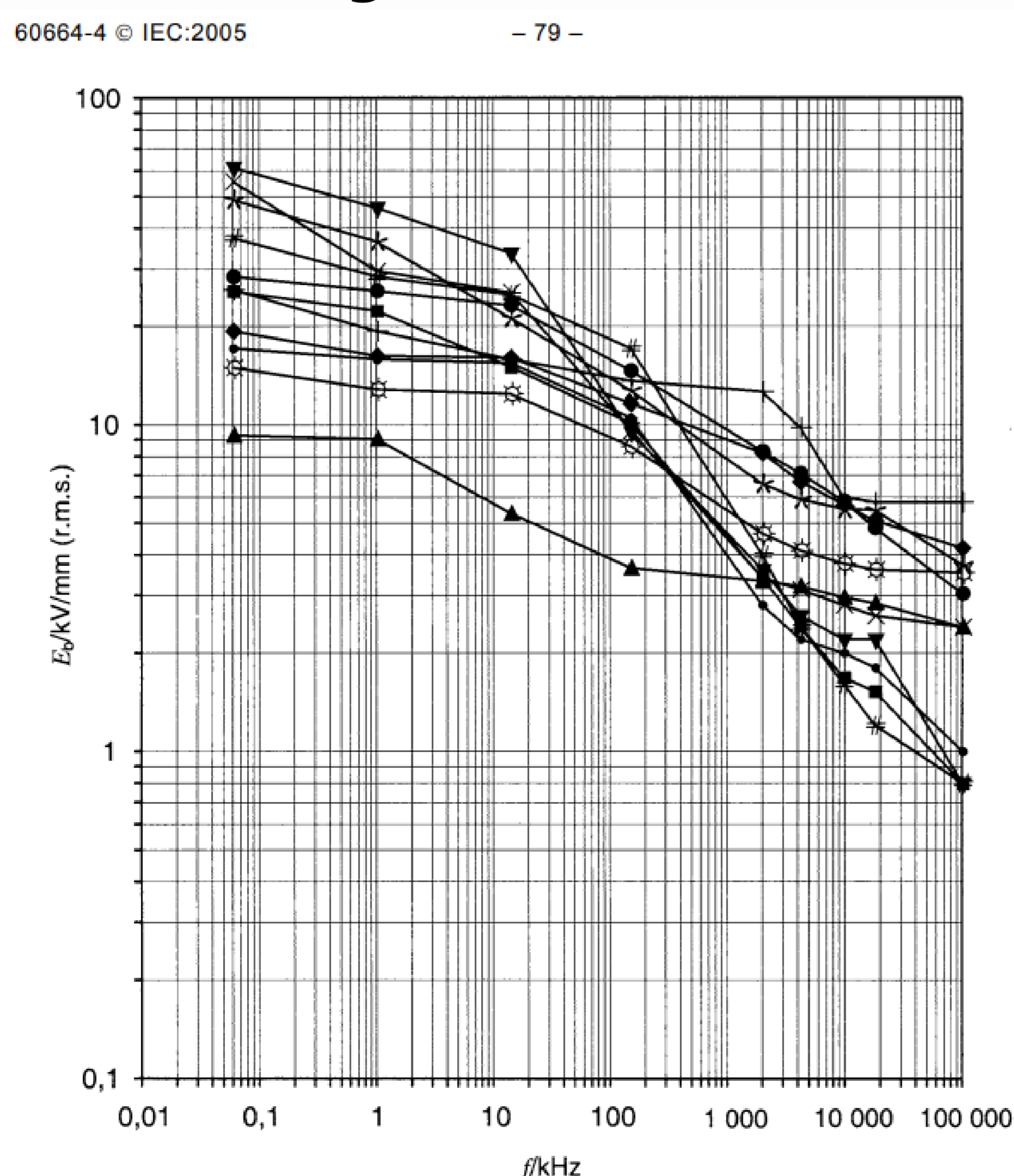


High frequencies have been measured

Although hard to measure, literature shows that these frequencies do occur in the grid, at higher voltages



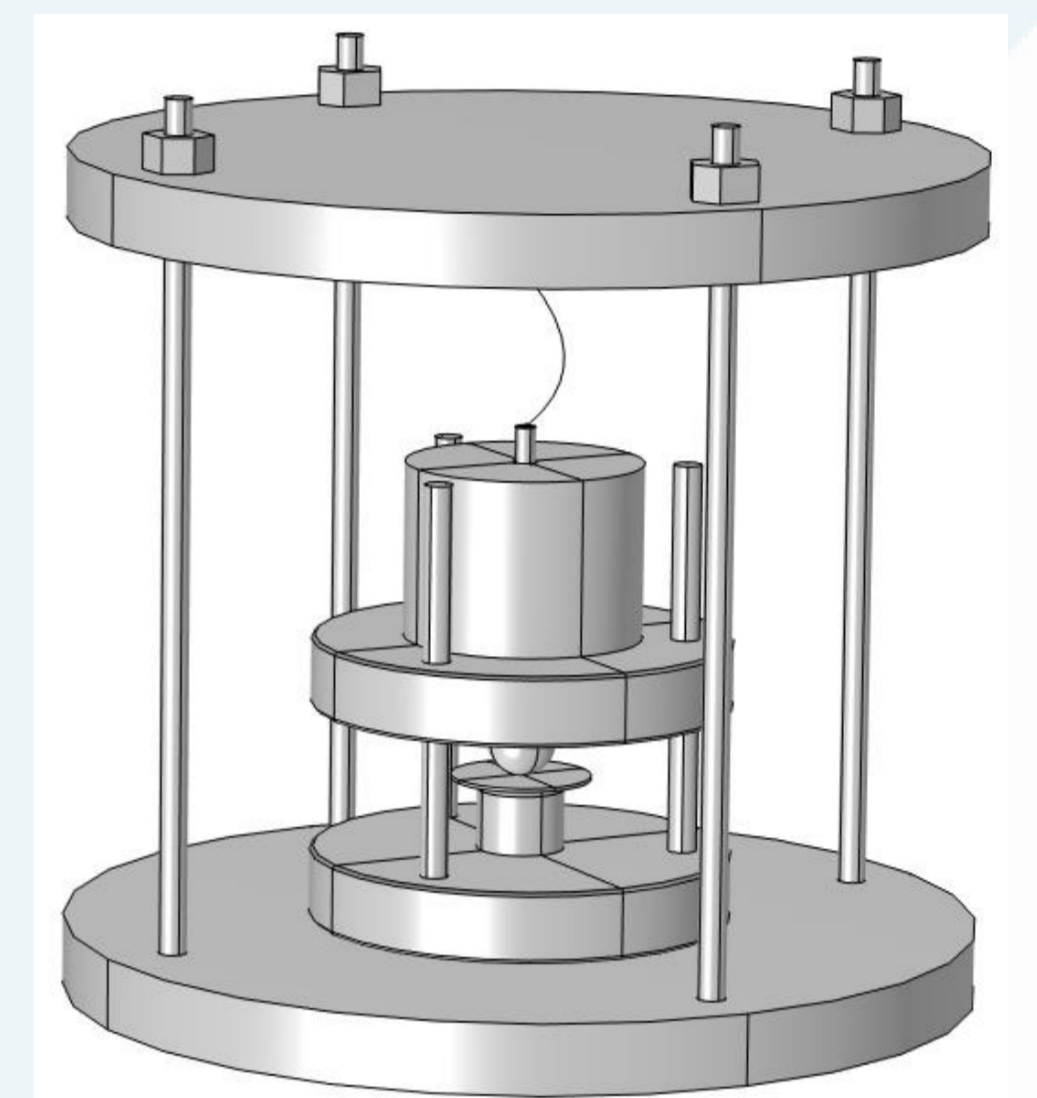
Breakdown voltage decreases with frequency



Approach

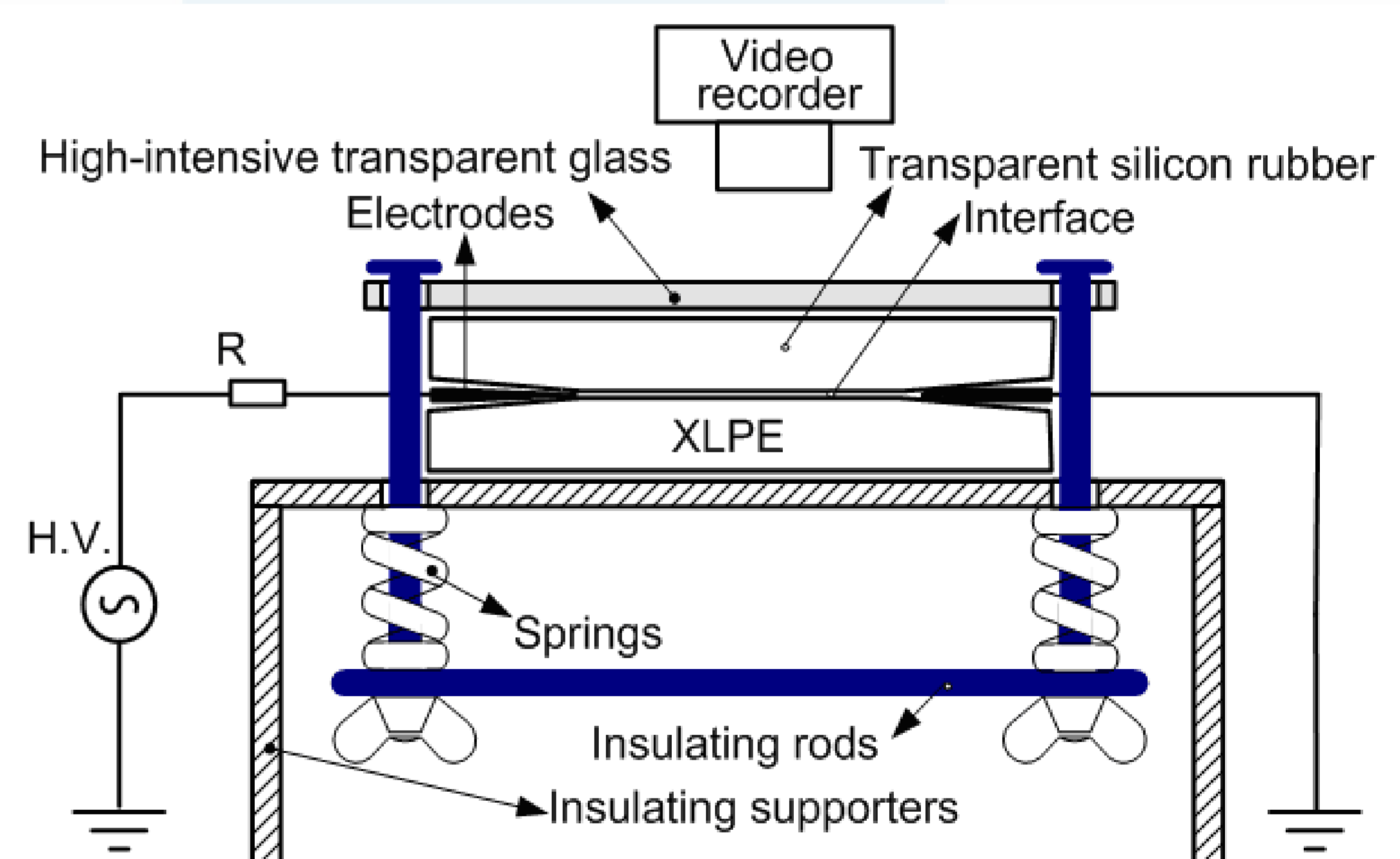
Cable insulation material will be tested on:

- Fault inception:
- Breakdown voltage
- Aging test
- Fault propagation
- Tree development



On different frequencies, voltage levels and temperatures.

Both XLPE will be tested and the interface of XLPE with the termination material:



What will be the impact to our grid?

Ultimately we aim to gain more insight in the lifetime of our assets in these new conditions.

- How long can they last?
- What type of mitigations?
- What type of damage to be expected?

Please feel free to share your thoughts

