

PROMOTioN & Develop monitoring and diagnostic methods for HVDC GIS equipment – Task 15.2

Arnhem, Sept 20th 2018

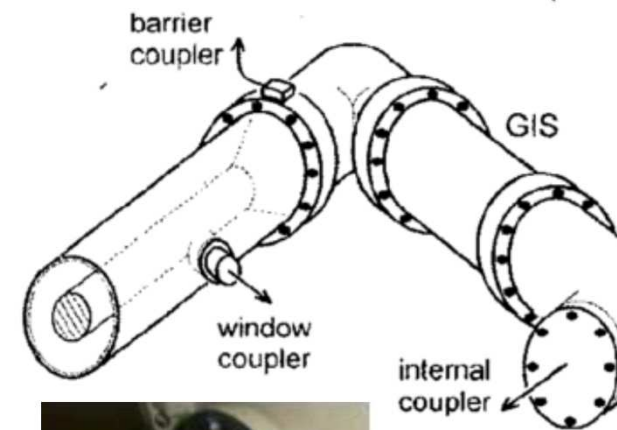


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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 691714.

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Development of M&D System for HVDC GIS based on HFCT

VHF/UHF systems for PD measurements

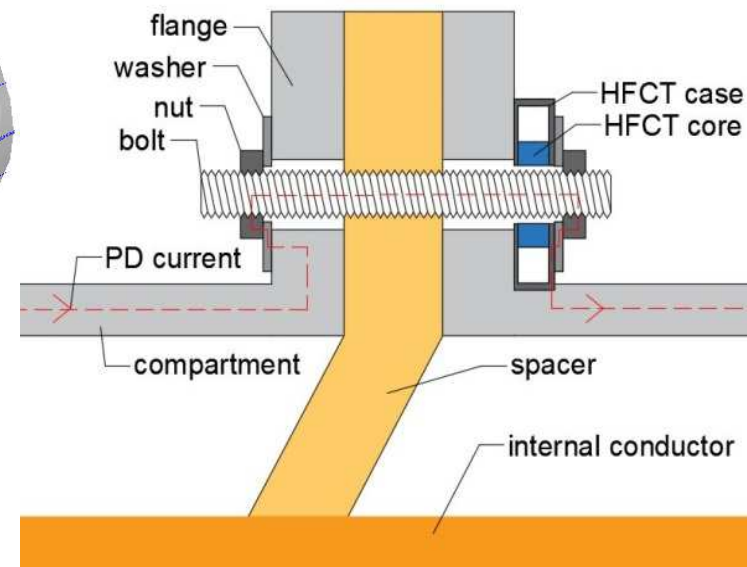
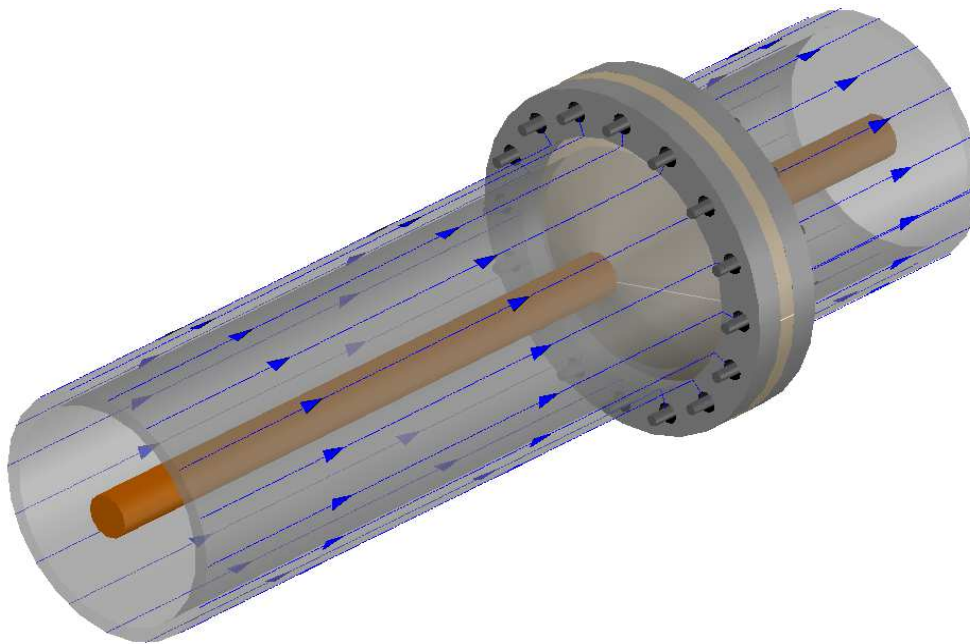


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A partial discharge system that measures the conductive current of a PD event by HFCT



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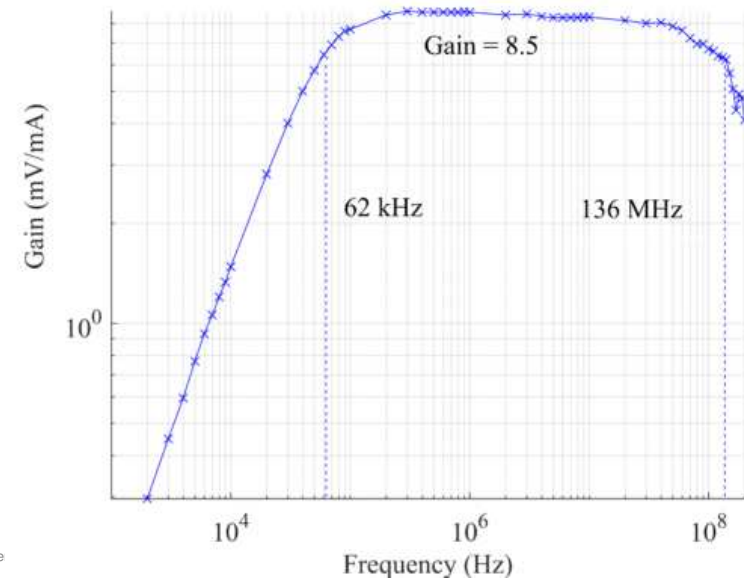
Where does this system lay on according to frequency range?

- IEC60270 – up to 1MHz (conventional method)
- IEC 62478 – HF (3-30MHz)
 - VHF (30-300MHz)
 - UHF (300-3000MHz)

Electromagnetic waves

Conductive current

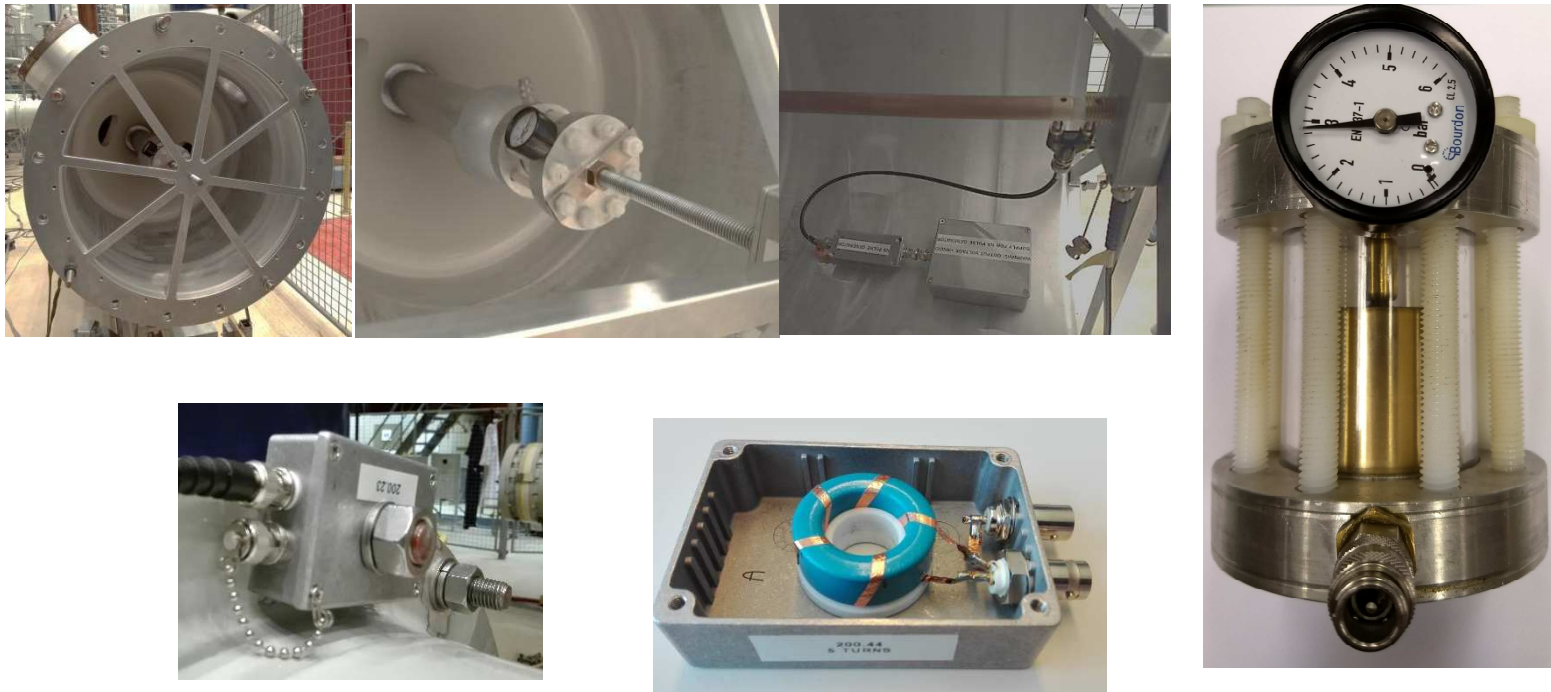
HFCT (62kHz-136MHz)



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Test set-up: test cells, HFCT, special installation point in the GIS

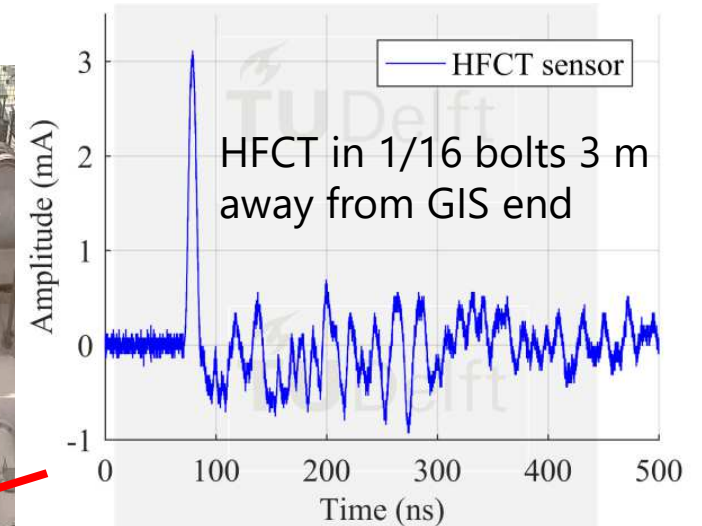
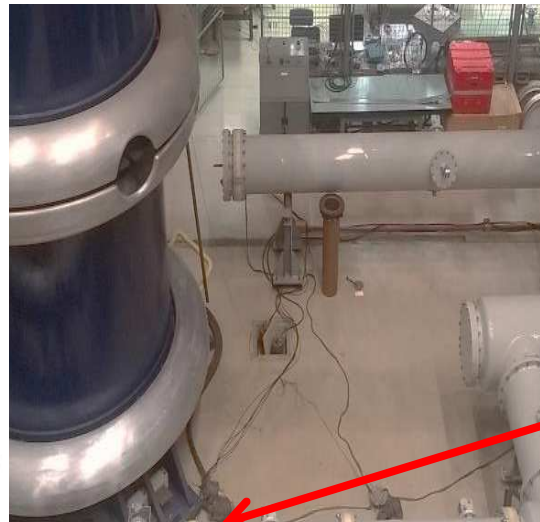
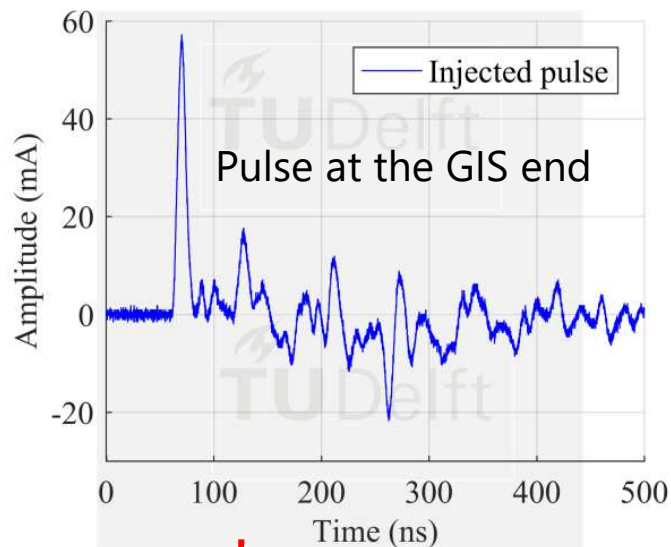


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Results: the system is able to pick up the small PD current.



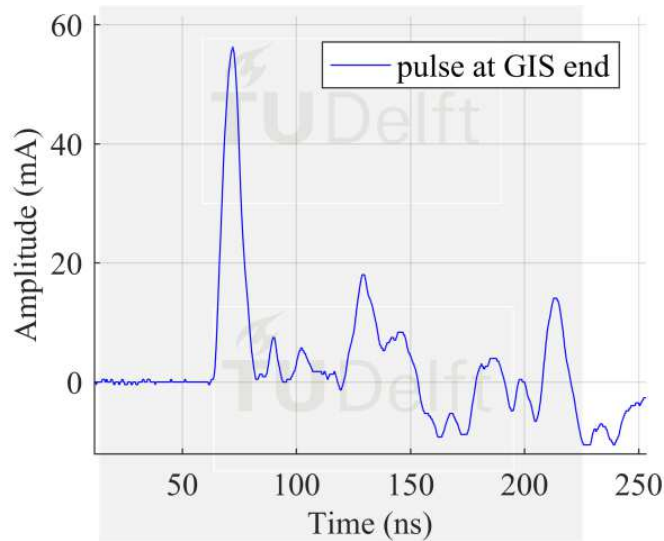
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symmetric.

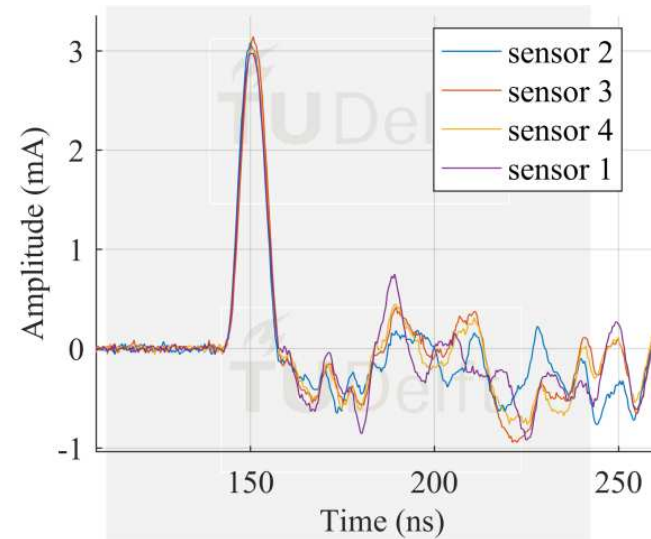
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Results: the PD current distributes homogeneously as it travels along the GIS compartments.



Pulse at the GIS end



HFCT in 4/16 bolts 3 m away from GIS end

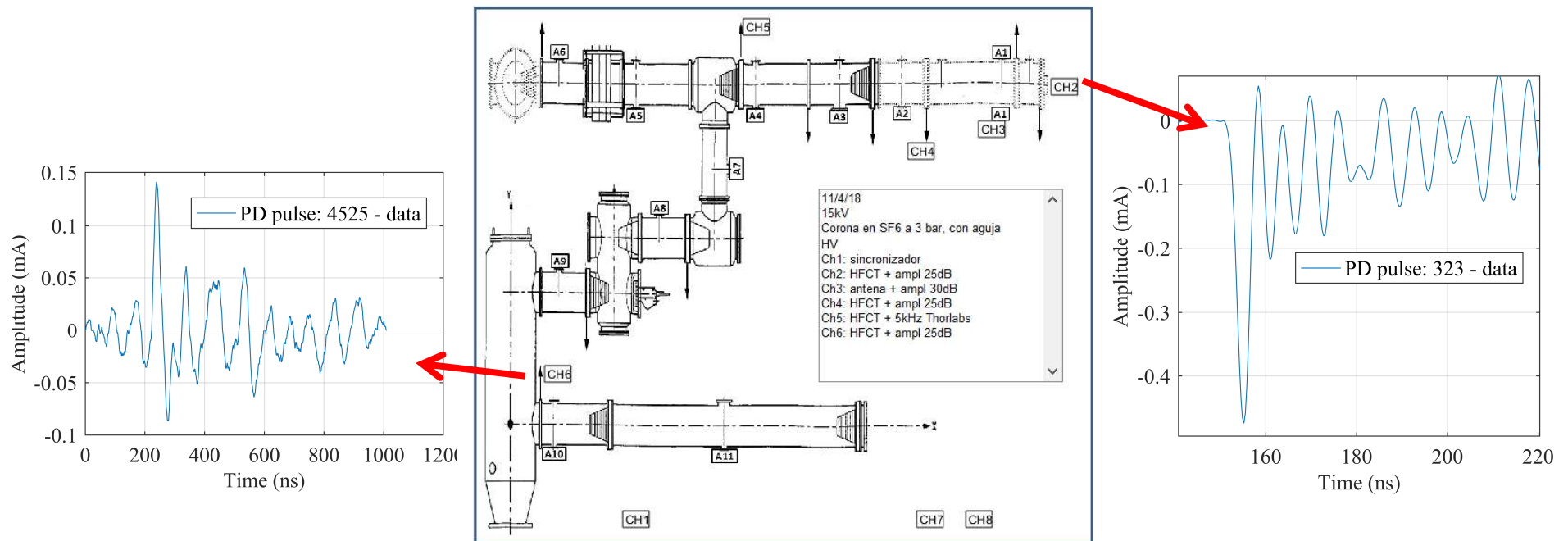


symmetric.

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Results: Enough sensitivity to pick up signals at the other end of the GIS



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Development of M&D System for HVDC GIS based on HFCT

Conclusion so far

- PD measurements on HVDC GIS based on HFCT are feasible and might have potential for charge estimation, which is not possible with current RF systems.
- Minimum requirements for implementation in old and new spacer's designs.
- The attenuation of PD signals is small as it propagates through the GIS length. Therefore one single sensor can detect a PD source meters away from it.
- Possible to achieve a sensitivity down to pC range as compared to IEC and RF systems.
- Polarity of pulse may be use for location purposes

