

# Paris Session 2022



## Composite DC AC voltages

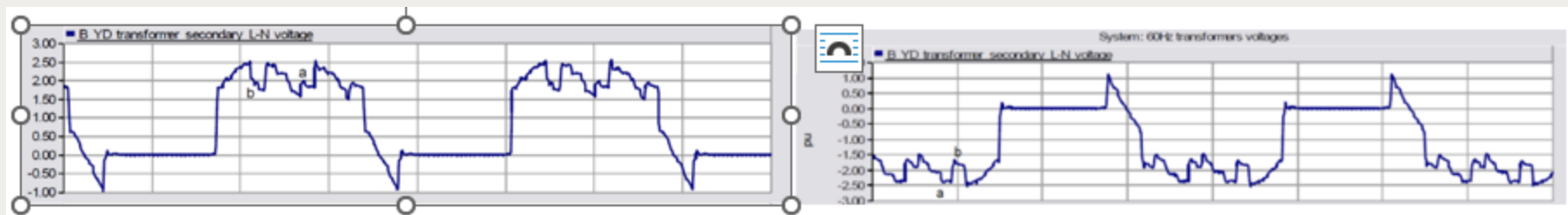
MATERIALS AND EMERGING TEST TECHNIQUES *SC D1*

PS1 Question 01

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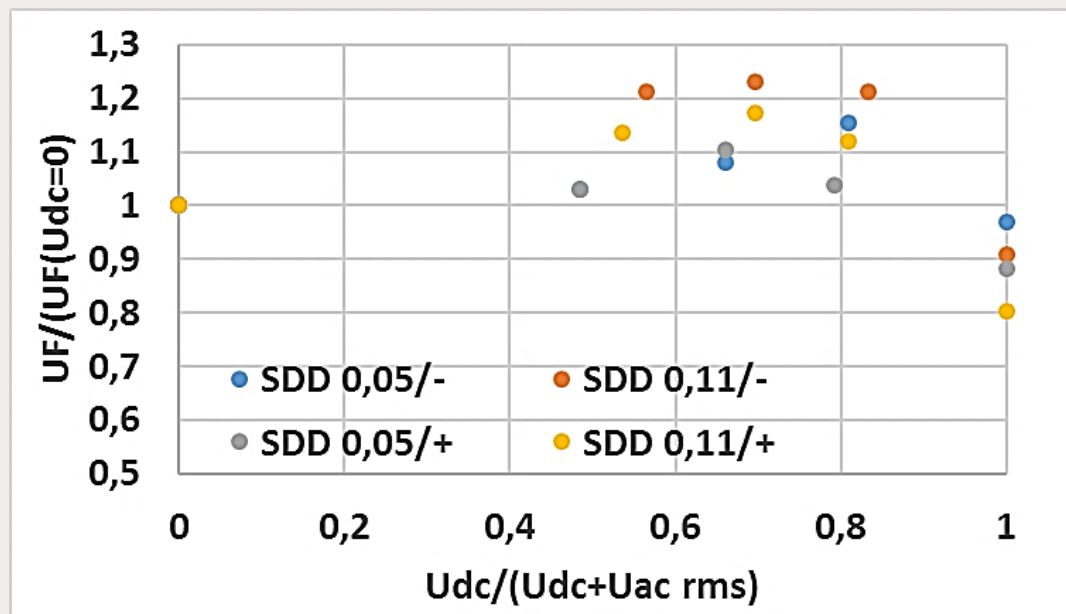
# DC AC (harmonics) composite voltages

- “Hybrid overhead lines” could cause both AC and DC voltage components (known as composite voltages) to appear on line insulators
- More complex voltages in the case of converter transformer bushings (combination of DC and different harmonics)



- Since the insulator pollution performance is very different under AC and DC it is very important to define the equivalent voltage stress to be taken as the basis for design.

## Results of tests with DC/AC voltages on short samples



- AC DC test results on short composite insulator samples indicated that the flashover voltage under the mixed voltage is higher than the value expected under pure AC across a wide range of DC/AC values (CIGRE 2016 paper D1-112 by Wagner and al)

# CONCLUSIONS

- The assessment of the representative stress condition (DC/AC/ composite??) is very important from the point of view of the correct design under pollution conditions
- The available results are very limited and the limited information is relative to short insulators and to a specific test circuit
- Additional investigation is recommended:
  - on larger and more representative samples
  - with more representative stress condition