Task 3: Measurement of the Voltage-Time Characteristic of an Insulator
(Laboratory F1-13, main lab)

Measure the voltage-time characteristics $U_m = f(t_p)$ of supporting insulator and sphere gap using the impulse generator. Both characteristics should be together in one graph. Both characteristics compare in conclusion.
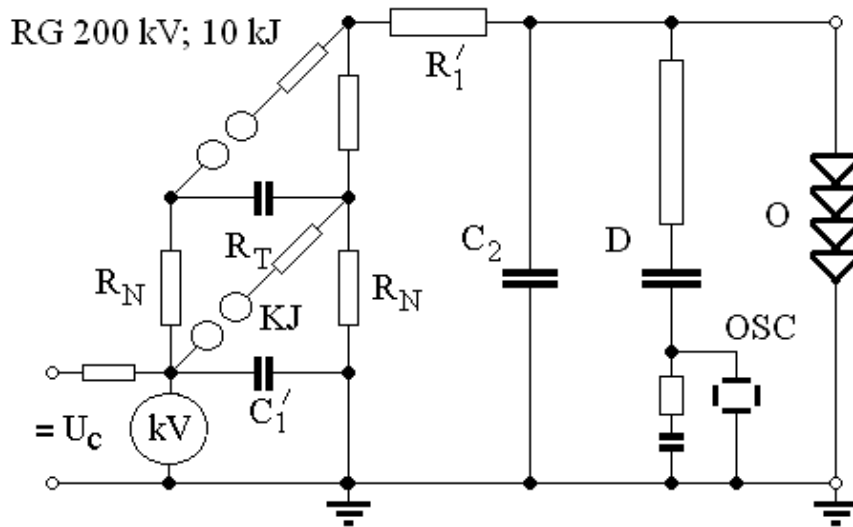
Measurement circuit:

Fig. 1: Electrical circuit of impulse generator for impulse testing of insulators

R_N – charging resistor
R_T – dumping resistor
C_1 – charging capacitor
R_1 – front resistor
C_2 – parasitic capacity of the impulse generator

D – high voltage RC divider
OSC – digital oscilloscope with a measurement chain
O – test object – supporting insulator/sphere gap

Setup for measurement and evaluation:

Carry out the measurement at least in 5 points (five different peak values of impulses when the flashover will occur) for each voltage-time characteristic. Each point should be measured three times (to respect the flashover probability in air). Resulted value of peak voltage is then given as average value. The time values are initial times of flashovers. Plot the impulse peak voltage amplitude dependency on time of flashover $U_m = f(t_p)$.
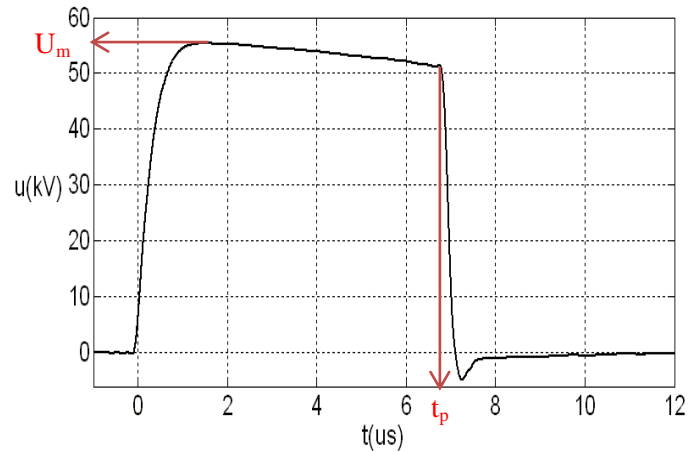
Fig. 2: Example of applied impulse voltage at flashover (the peak value and the initial time of flashover are marked)
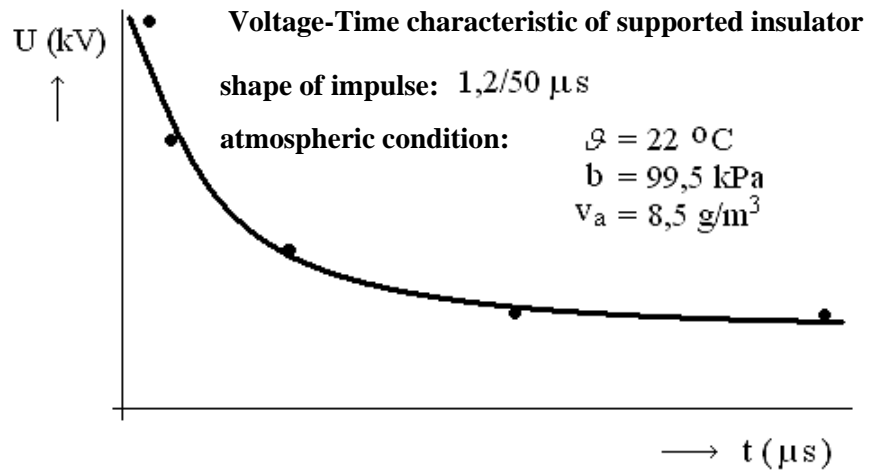

Fig. 3: Example of voltage-time characteristic