Exercises on High Voltage Engineering

Lecture: High Voltage Measurement (2)

Yuanxiang Zhou

**Supplementary Exercise 1:** Suppose there is a high-voltage resistor divider, with the overshoot *β* on its step response wave is almost zero, and the theoretical step response (with the actual zero point as the origin) time *T*=0.2μs. If this divider is used to measure the impulse short-wave voltage *u*1(*t*)=*A*[exp(-*αt*)-exp(-*βt*)], where *α*=0.235μs-1 and *β*=1.85μs-1, please calculate:

1. The measured voltage waveform *u*2(*t*)=?
2. By how many microseconds is the time *t*m at which *u*2(*t*) reaches its peak amplitude delayed compared to the time *t*1m at which *u*1(*t*) reaches its peak amplitude?
3. What is the relative measurement error of the peak amplitude of the impulse voltage?