

Exercise Worksheet 3

15. November 2011

Exercise 1

- Given is a power consumer with rated power of $1MW$
- Resistance of complete conductor is 10Ω
- The system voltage is $110kV$

Part A

Please calculate the power dissipation of the system caused by the resistance of the conductor:

Part B

Now the system voltage is changed to $220kV$. The new power consumer has again a rated power of $1MW$. Please calculate the losses for the higher voltage. The conductor remains the same. Are they increasing or decreasing ?

Exercise 2

The values of the cable is given:

- length of the cable $100km$
- $\underline{U} = 110kV$
- $f = 50Hz$
- $R' = 109 \frac{m\Omega}{km}$

- $L' = 1.2 \frac{mH}{km}$
- $C' = 9.5 \frac{nF}{km}$
- $R_L = 200\Omega$

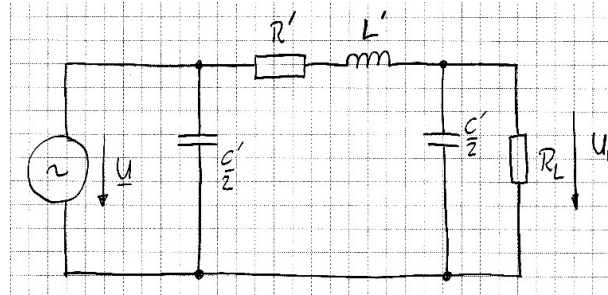


Abbildung 1: Equivalent Circuit of a cable

Part A

Please calculate the voltage \underline{U}_L

Part B

Please calculate the voltage \underline{U}_L if the System is operated with $110kV$ DC (direct current).