Exercises

1. A crystalline silicon solar cell with total area of $1m^2$ has a power conversion efficiency $\eta=0.2$, an open-circuit voltage $V_{oc}=0.7V$ and a fill-factor FF=0.9. a) Calculate the peak current produced by the cell. b) Two copper wires with total resistance 0.3Ω are used to trasport electric energy to the user, calculate the fraction of power produced by the cell that is dissipated by the wire because of Joule effect.

2. A solar cell has a short circuit current density of 30 mA/cm^2 and open circuit voltage 0.6V under AM 1.5 illumination at room temperature. Use the ideal diode equation to calculate the open circuit voltage which is expected under illumination by 100 suns, stating any assumption made. In practice, an open circuit voltage of 0.66V is measured. Compare this with your result and discuss any discrepancy.