solar_iv_2.sqproj
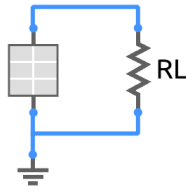

I-V characteristics for different r_shunt values

The purpose of the simulation set-up shown in the figure is to observe the effect of the shunt resistance[1] on the performance of a solar cell, with a fixed photo current. In the solve block, for each value of R_{shunt}, the load resistance R_L is varied, and the current and power are stored. This procedure amounts to varying the cell voltage from $0\,\text{V}$ to V_{oc}, and it gives the I-V curve for one specific value of R_{shunt}.

Exercise Set

1. Run the simulation. Plot I versus V, and observe how R_{shunt} affects the solar cell performance.

2. Plot P (output power of the cell) versus V. For each value of R_{shunt}, note down the maximum power P_{max}. Now plot manually P_{max} on linear scale versus R_{shunt} on log scale.

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[1]Note that by shunt resistance, we mean the *internal* shunt resistance of the solar cell; it should not be confused with R_L which is *external*.