Physics 80

November 20, 2017

1 Labs

DC circuits: (DC supply, DMM, resistors and capacitors) Using protoboards and DMM, study resistors in series and parallel, also delta/wye configuration. Also look at DC blocking capacitors and the effect of DMM loading (i.e. measure impedance of meter). Solder geometric shapes of resistors and compare resistance values to calculation.

TE circuits: e Calculate TE for complicated resistor and DC voltage circuit and measure TE parameters in the lab. Measurements they can make (1) short circuit current (DMM), (2) open circuit voltage, (3) several resistor values. Offline plot in python showing Resistor load curves and TE curve, intersecting at each data point. *Option 1:* Introduce scope and function generator to make something visual.
Option 2: Current sources and Norton equivalence.
Option 3: Limitations of real devices?

RC and RL transients (Function Generator and Scope): With square waves measure transients for Resistors and Inductors, compare with theory offline in python. Wrap inductors and estimate its inductance and series resistance from scope.

Impedance and Transmission Lines Bode plots in gain and phase for RC low-pass and high-pass filter which they plot in python offline.

Resonance

Diode

Noise

Geiger Statistics

Optical

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