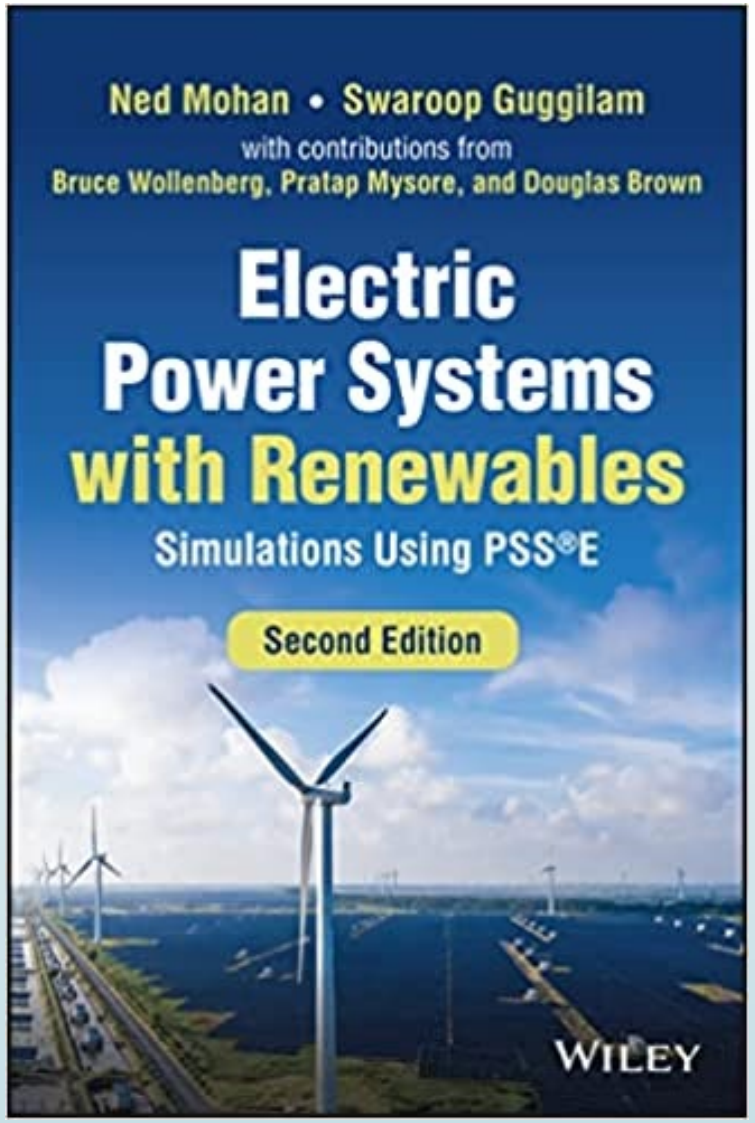
Power Systems Textbook/Lab using PSS®E and Python

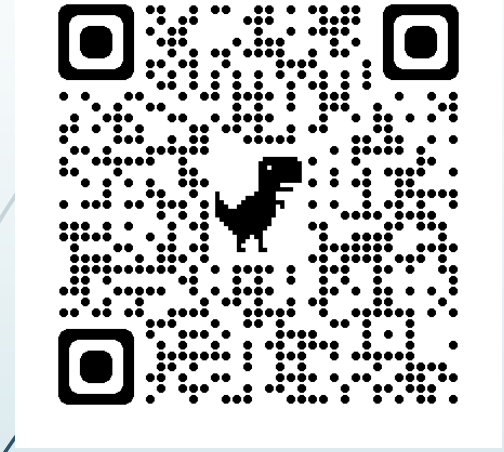
- Swaroop Guggilam, PhD (EPRI)

Associated Textbook

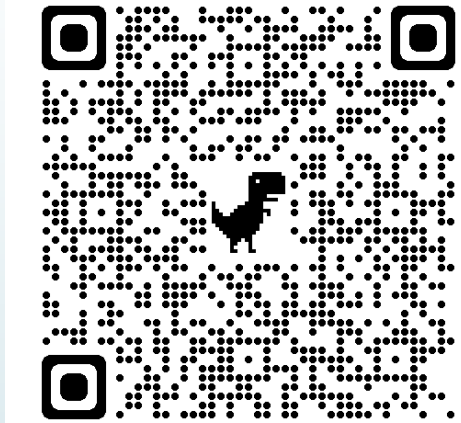
Amazon Link



Highlights

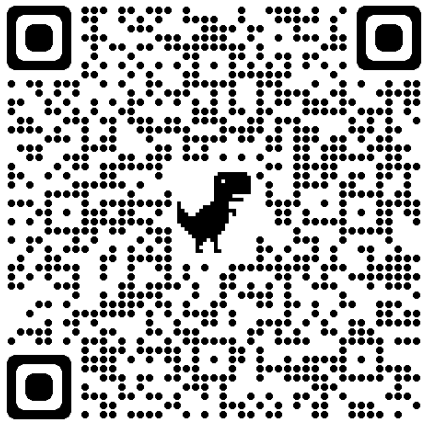


This lab will be available on **CUSP (https://cusp.umn.edu/)** website for **FREE**.



Software - PSS®E Xplore Student Version. Available for **FREE**.

Video tutorials available for **FREE**.



Live Webpage

WHY THIS LAB/BOOK?

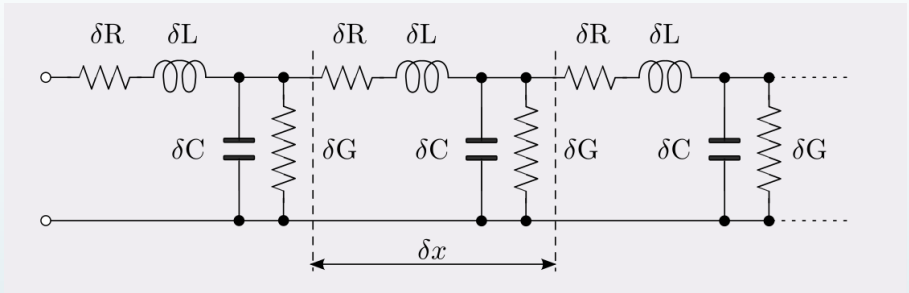
Modeling/Simulations/Visualization

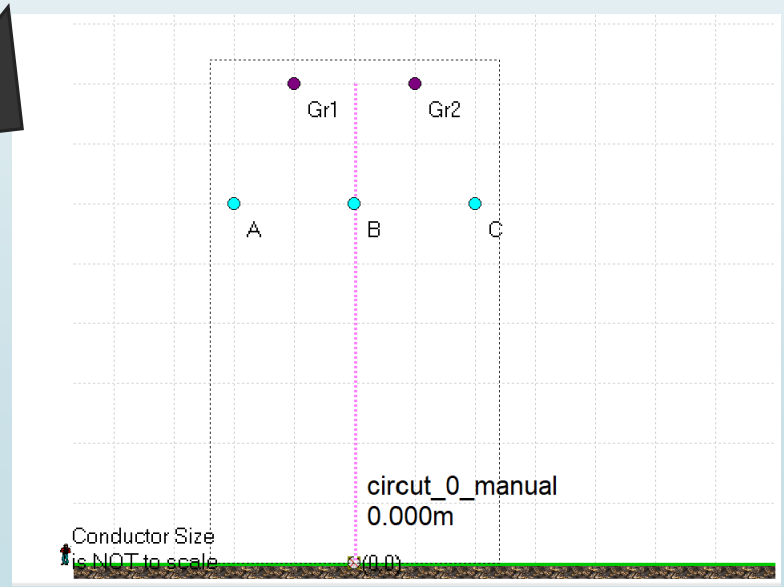
Industry Ready

Future

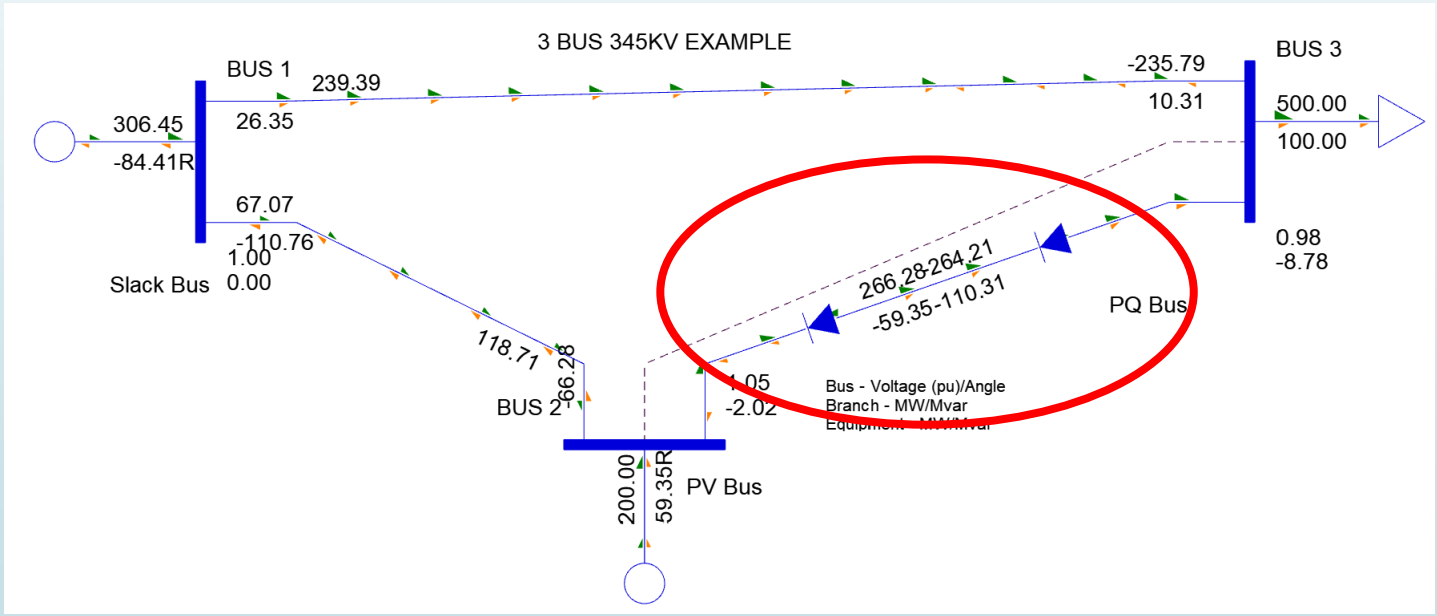
SAMPLE SIMULATIONS/EXPERIMENTS

TRANSMISSION LINE CONSTANTS

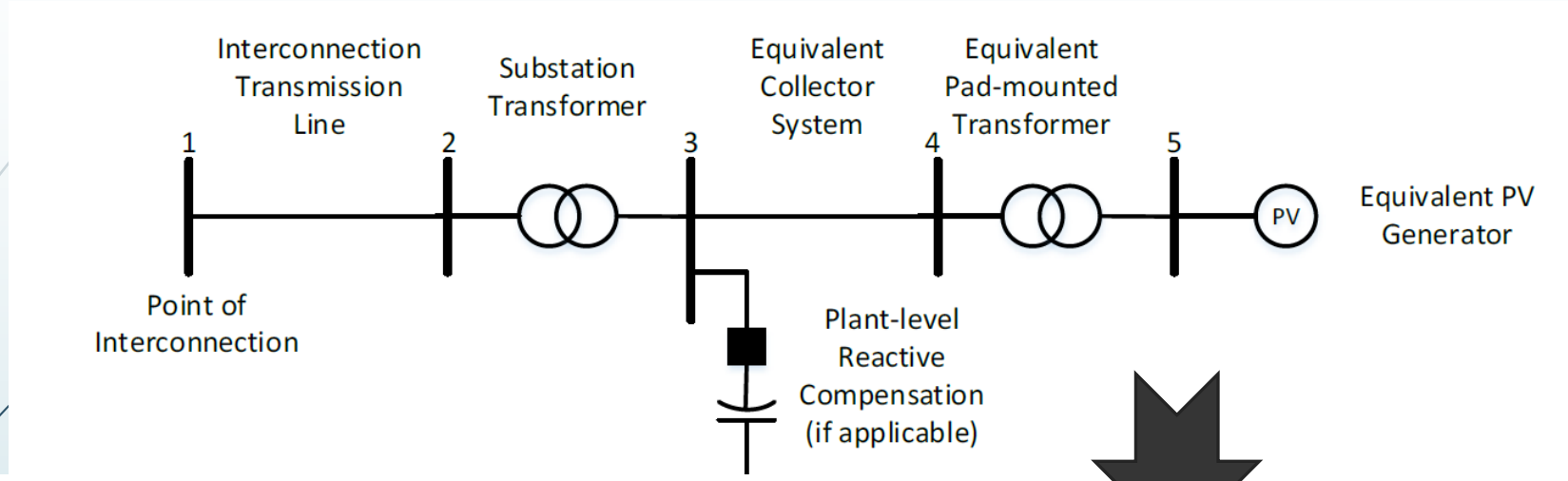




HVDC MODELING

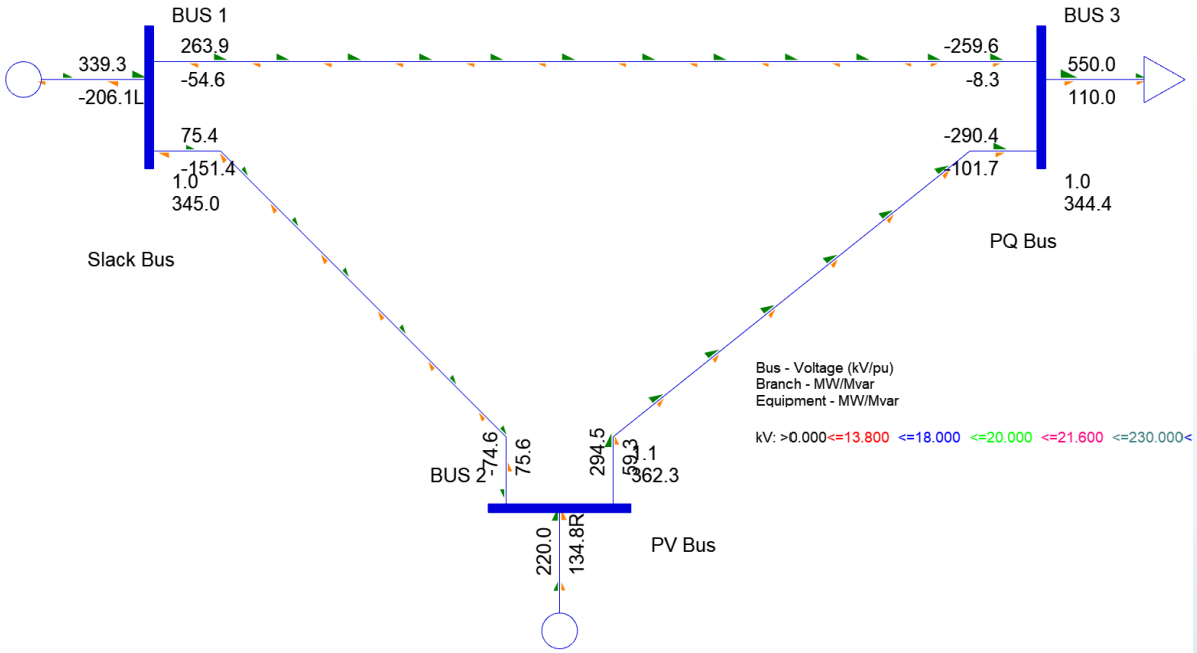


INVERTER BASED RESOURCES (IBR)



*https://www.wecc.org/Reliability/Solar%20PV%20Plant%20Modeling%20and%20Validation%20Guidline.pdf

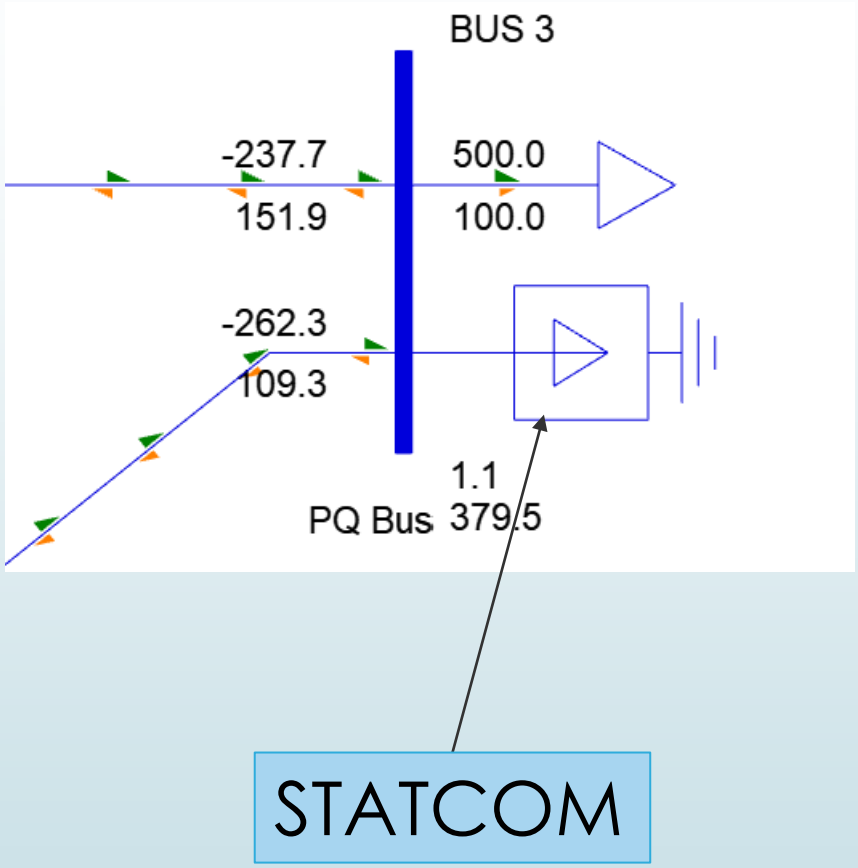
OPTIMAL POWER FLOW




```
Optimal Solution Found.

Minimum fuel cost objective: 2190.99

Elapsed time: 0 minutes, .109863E-01 seconds.

GENERATOR FUEL COST SUMMARY:
----------------------------

   ID TYPE FUEL $      MW OUTPUT     MW MINIMUM MW MAXIMUM    BUS#-SCT X-- NAME --X BASKV ID     PGEN      PFRAC
 ---- ---- ---------- ----------    ---------- ----------  ------------------------------ --    --------  -----
    1 POLY     1402.48      361.20         50.00      450.00       1      BUS 1        345.00  1    361.200  1.000
    2 POLY      788.51      197.90         50.00      300.00       2      BUS 2        345.00  1    197.902  1.000
           ========== ==========    ========== ==========
   TOTALS:    2190.99      559.10        100.00      750.00
```

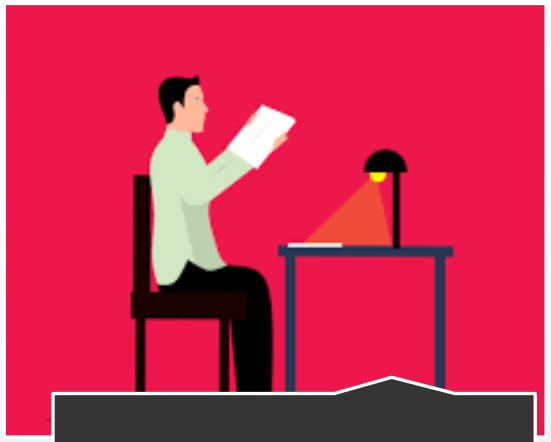
STATCOM

- Provides Voltage Regulation
- Inject or Absorb Reactive Power
- Applicable for Dynamic Simulation or Steady State Power Flow
- Linear V-I curve



PYTHON PROGRAMMING

WHY PYTHON?



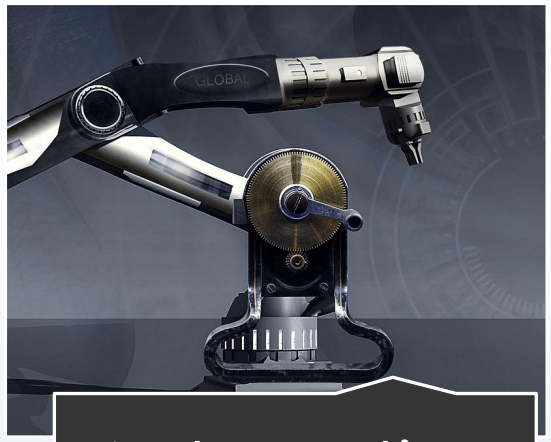
Easy to Learn

Accessible

Support

Libraries

PYTHON SCRIPTING



Automation

Plots

Bulk Analysis

Time Saving

Questions?

sguggilam@epri.com

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