The main Matlab script within this folder is called “SingleParameterFitting\_CENTRG1\_RealPMU.m” and “MultiParameterFitting\_CENTRG1\_RealPMU.m”. The overview of this scripts are as follows:

1. Define the genrou, pss2a, and exca8b model parameters for the CENTRG1 generator which will be later written to a dyd file.
2. Create a list of parameters to be ran during a single parameter fitting. Takes the form of list=[1,1; 1,2;…;]. If doing a multiparameter can just ignore this portion and then define theta\_indicies.
3. Load in event data and setup file names to be used during the simulation.
4. Setup the PowerWorld case by calculating the voltage and power values to get the correct P,Q, and V values from the initial point in the PMU event.
5. Write the PlayInData.aux file which contains all the v and f values which will be read in to the PlayIn generator. Also, the option to add noise to this data is available(shouldn’t need with real PMU data).
6. Setting up the options of the lsnonlin function then running the lsnonlin function which calls my residual\_Jacobian\_PowerWorld\_RealPMU.m function which runs multiple PowerWorld simulations to calculate the Jacobian and residual.
7. Saves fitted data.