ECEN 452 Lab 11 – Free Space Measurement with GRL Calibration

Apply the report template to discuss the theory, setup, procedure, and sources of error for the Gated Line Reflect (GRL) calibration. In the results/discussion section, include the following plots:

S11_TD_wReflect_preGRLcal.csv – This is a plot of the time domain S11 data with the reflect in place. Remember you can see the reflecting sheet as a local maximum at approximately 3.66ns.

S21_Thru_postGRL.csv – This is a plot of the frequency domain S21 data with an empty test fixture. Comment on what the measurement should look like given that the system is calibrated.

Air.csv, Cardboard.csv,Plexiglass.csv – Only plot the ε' data for each material. You can plot the three data sets on the same graph.

Questions to consider for the report:

What does it mean to transform into the time domain?

How do you interpret the S11 data in time domain?

How does looking at the time domain help with the calibration?

What are we looking for when we put the reflect in before performing the calibration?

How do the three materials measured compare to expectations?

How could we improve the calibration process to get more accurate results?