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ECE 438

3/13/19

Project 4

I have included the Simulink Model, Sine Wave block settings, and the three desired plots below. Under each of these plots there are zoomed in versions to get a closer look as well.

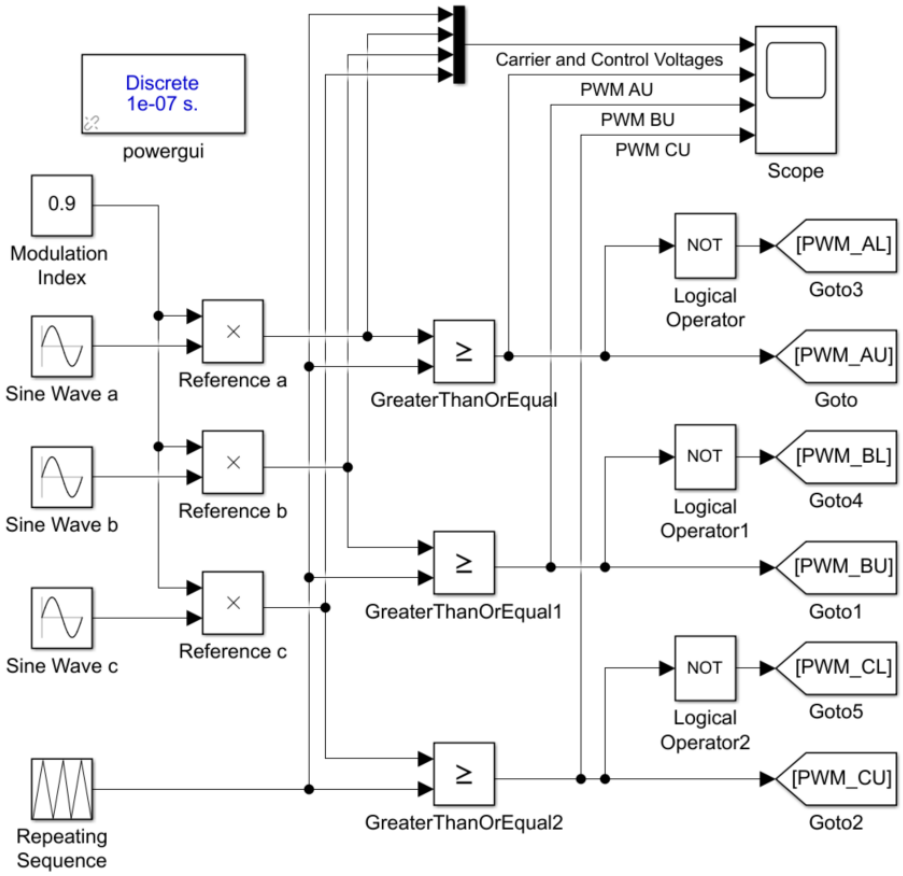

Figure 1: Simulink Model - Control Side

Shown above in Figure 1 is the control portion of the Simulink model. This generates the 6 PWM signals for the IGBT/Diode blocks.

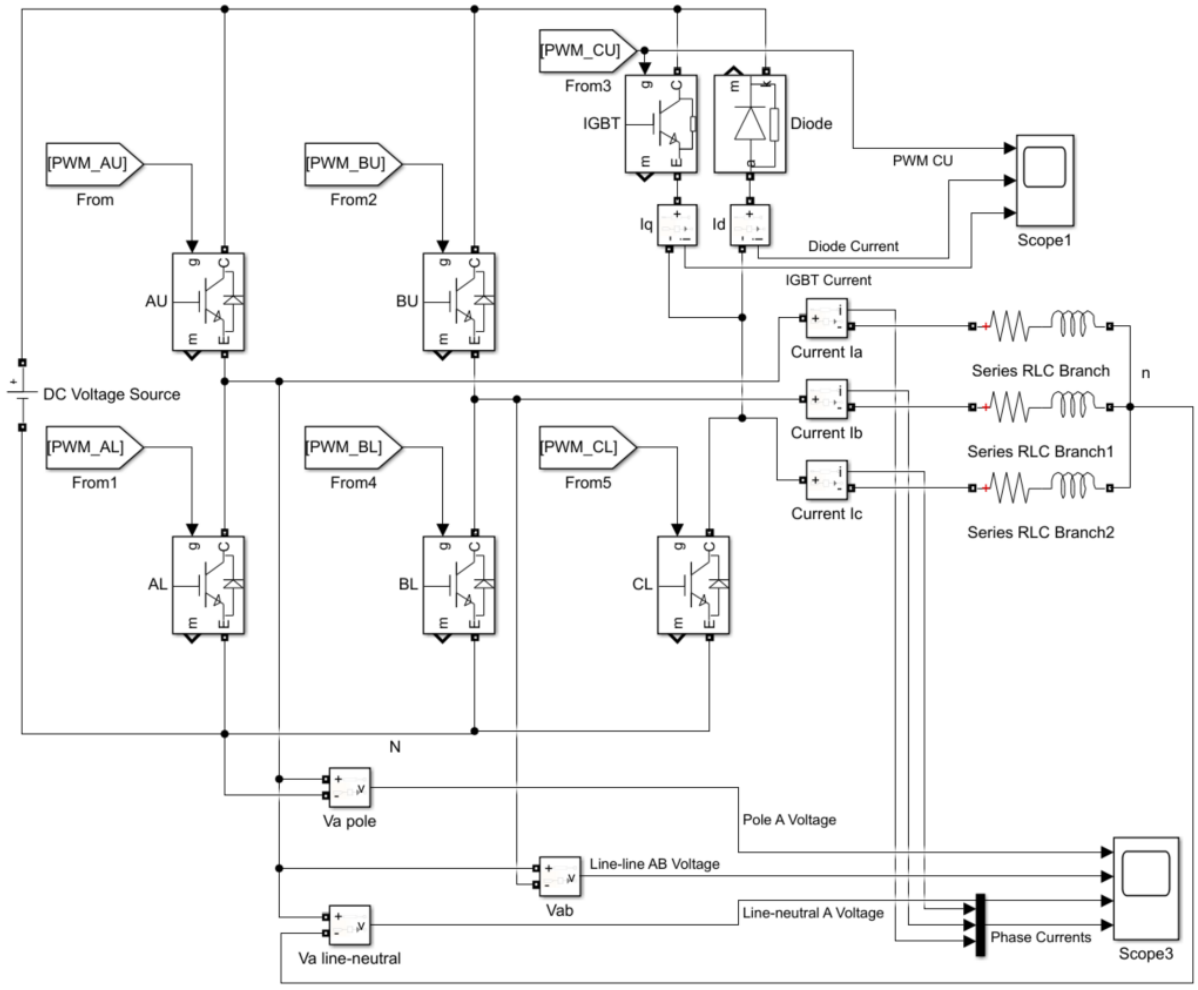

Figure 2: Simulink Model - Power Side

Figure 2 above shows the power portion of the Simulink model. This takes the control signals from the control side to turn on and off the IGBT/Diode blocks and subsequently controlling current flow through the RL load on each line.

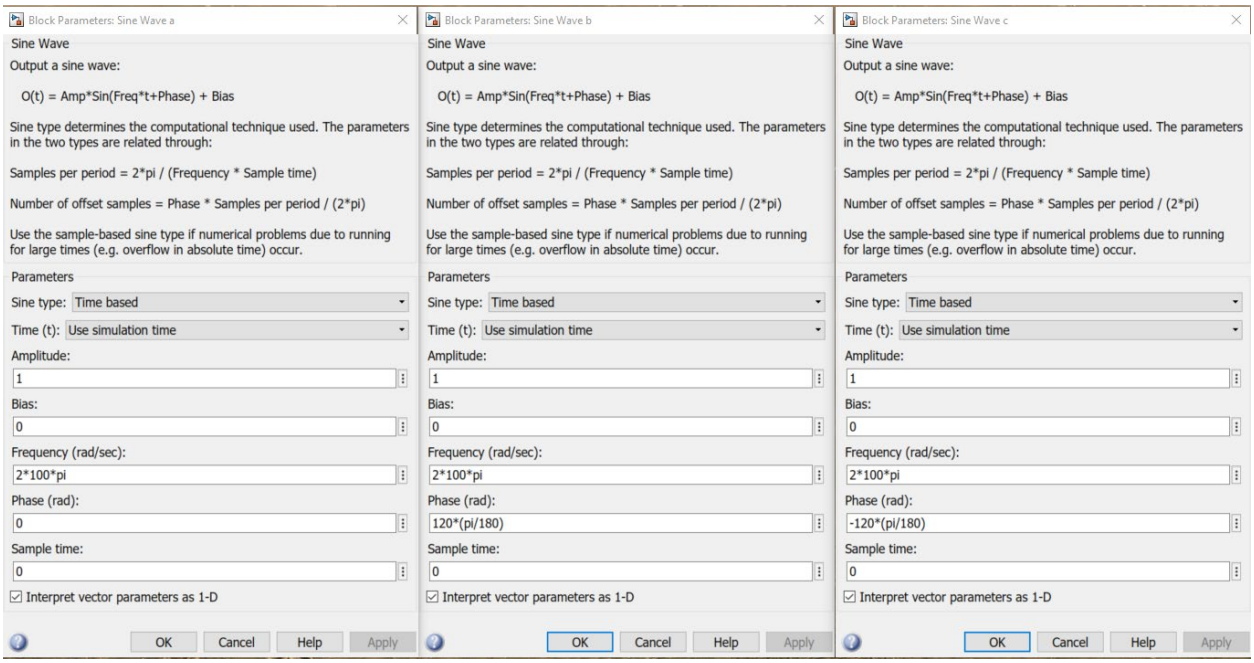

Figure 3: Sine Wave Sources

Shown above in Figure 3 are the three Sine Wave source block settings. The important variables here are the Frequency and Phase.

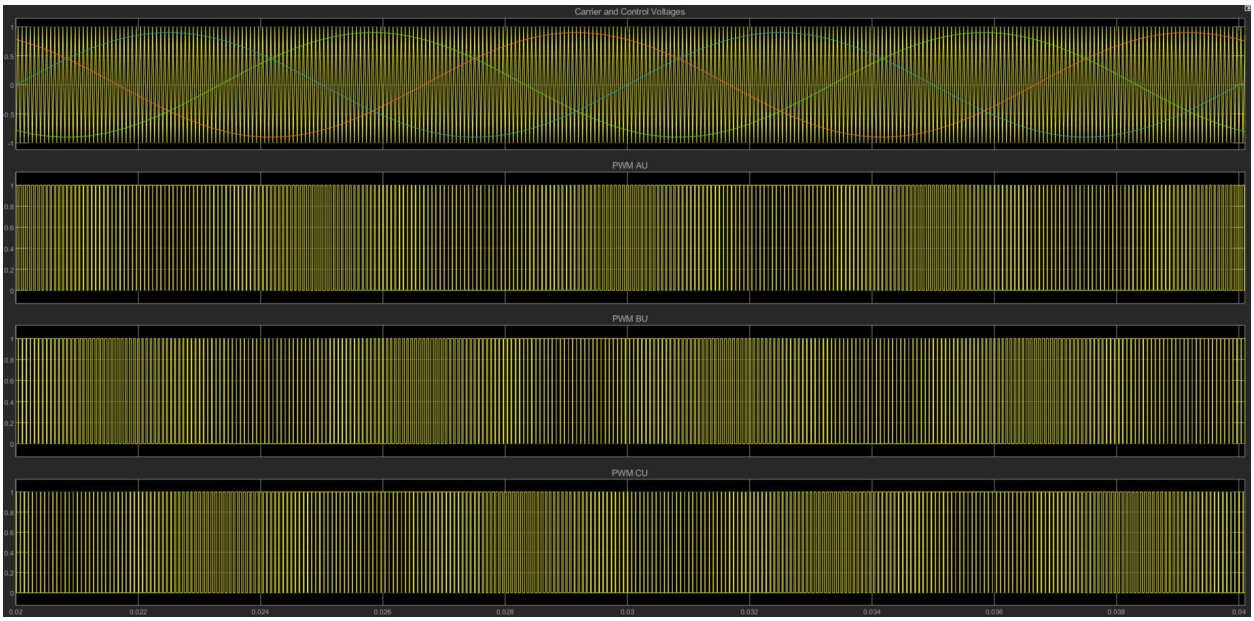

Figure 4: 3-phase PWM's and their Reference/Carrier Overlapping Comparison

Above in Figure 4 are the 3-Phase Reference/Carrier overlapping comparisons and the PWM signals AU, BU, and CU.

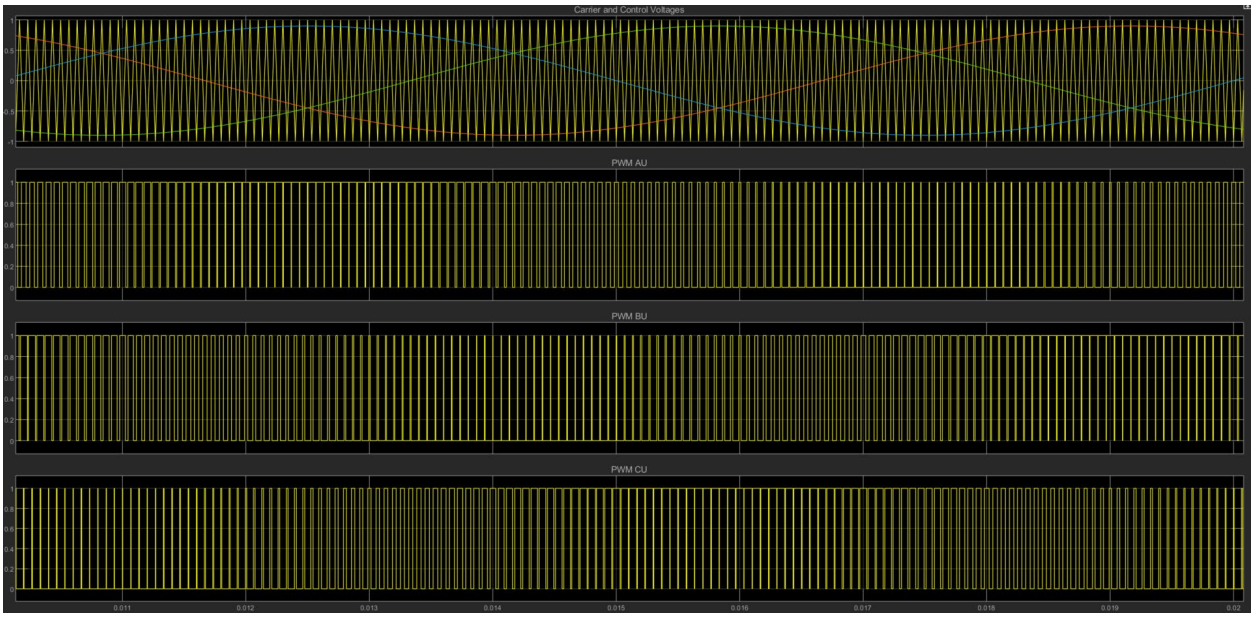

Figure 5: Zoomed 3-phase PWM's and their Reference/Carrier Overlapping Comparison

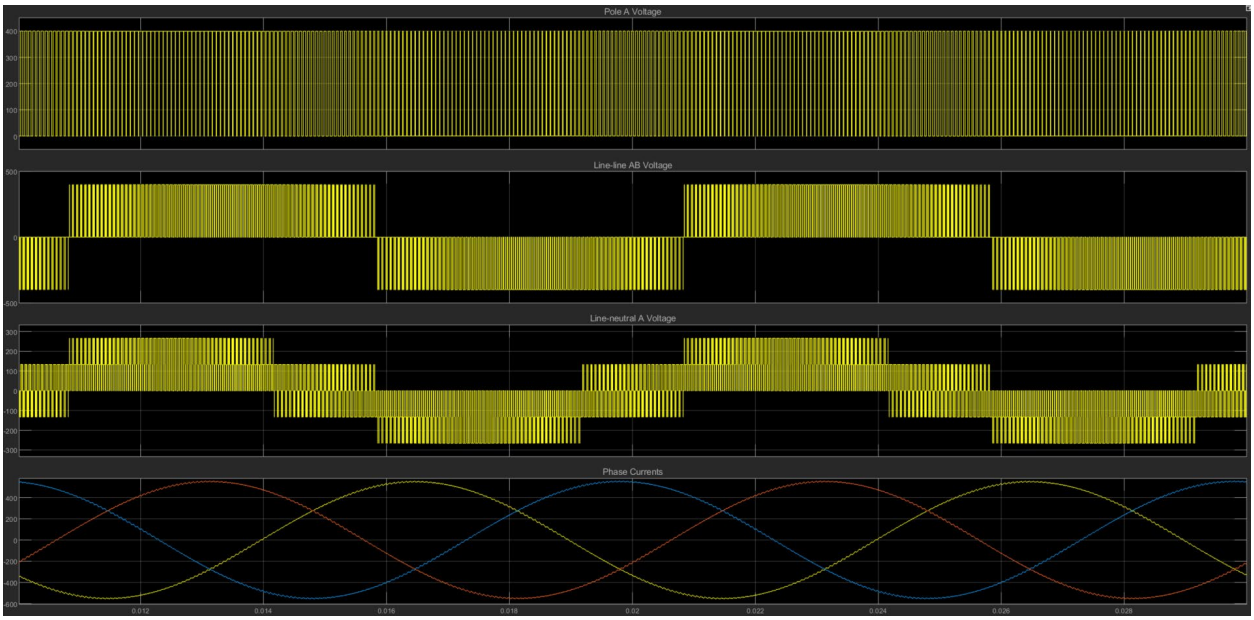

Figure 6: Phase A Pole Voltage, Phase AB Line-Line Voltage, Phase A Line-Neutral Voltage, and 3-Phase Current

Figure 6 above shows the Phase A Pole Voltage, Phase AB Line-Line Voltage, Phase A Line-Neutral Voltage, and the 3-Phase currents.

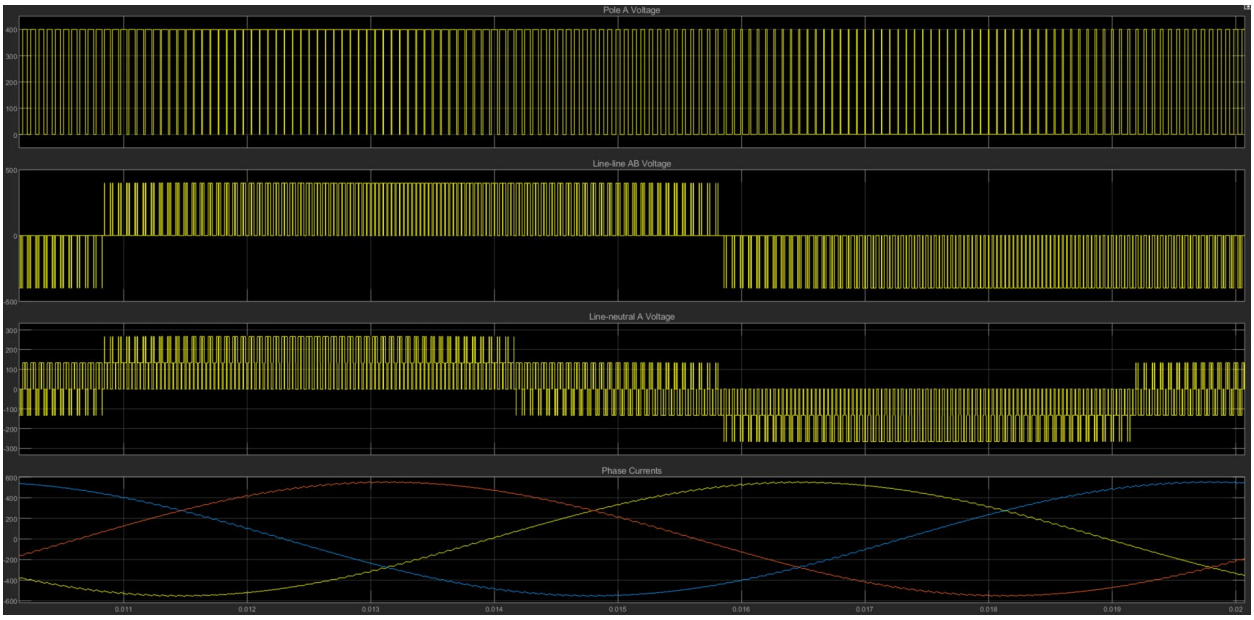

Figure 7: Zoomed Phase A Pole Voltage, Phase AB Line-Line Voltage, Phase A Line-Neutral Voltage, and 3-Phase Current

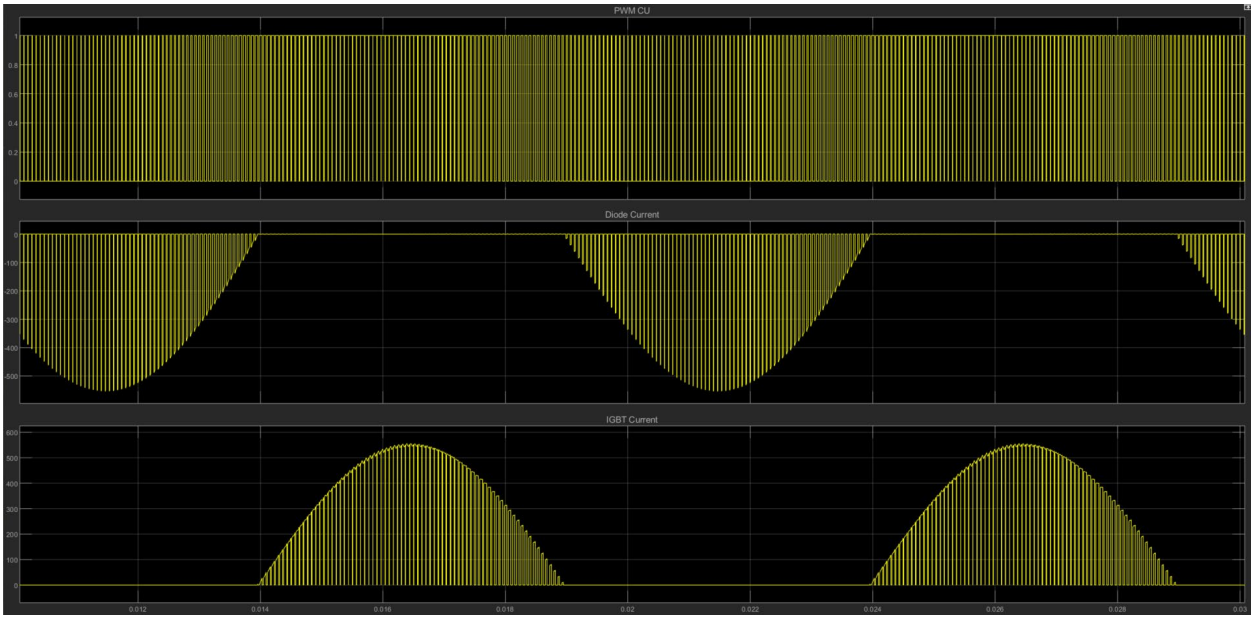

Figure 8: IGBT Current, Diode Current, and PWM

Above in Figure 8 is the PWM signal CU and the IGBT and Diode currents for that signal.

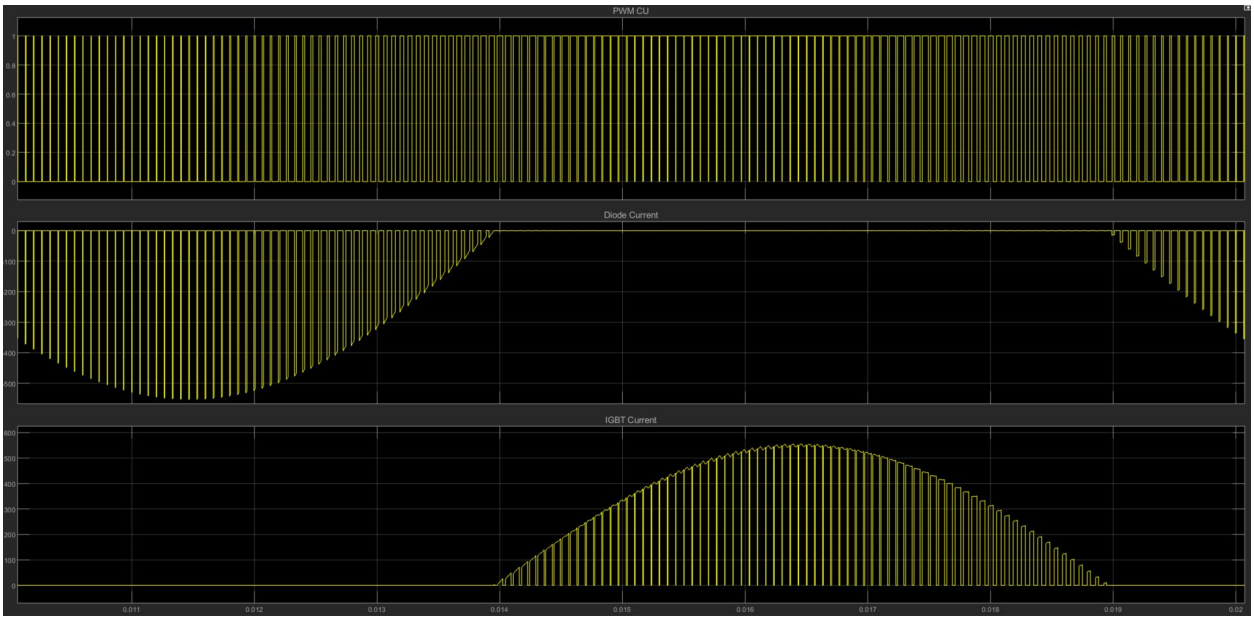

Figure 9: Zoomed IGBT Current, Diode Current, and PWM