PWM Incremental
Dhilip S – KGiSL Institute of Technology

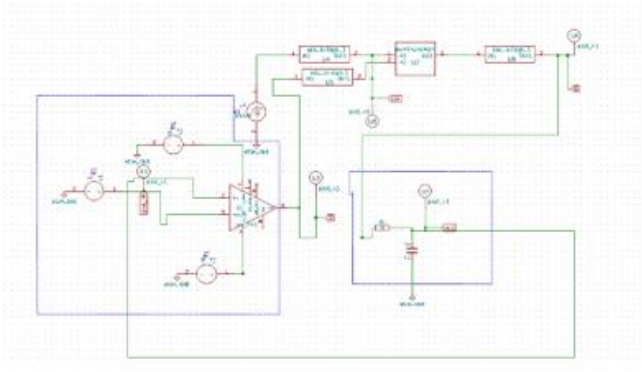
Abstract:

A novel pulse-width modulation technique for three-phase voltage-controlled inverters is presented. Description of a microprocessor-based modulator capable of completing in real-time all the computations required for adjustable frequency, magnitude and phase control of the inverter output voltage is provided.

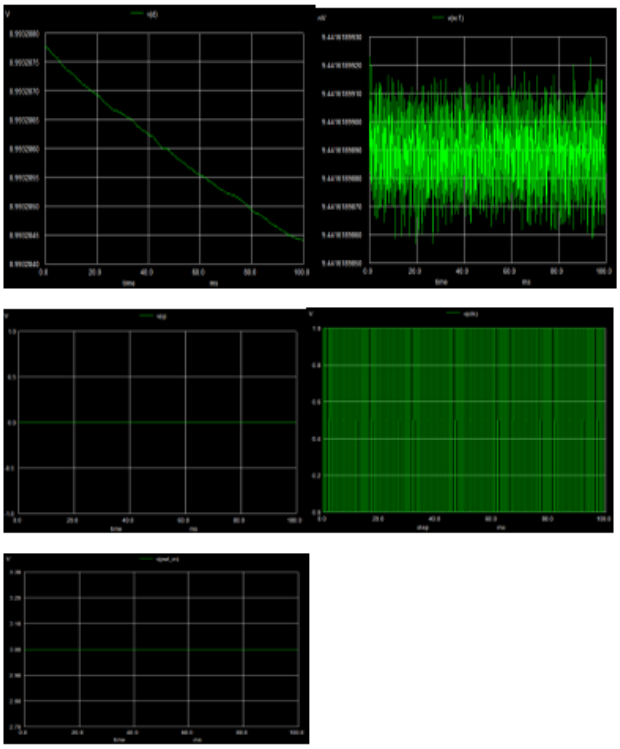
Participant Circuit Details:

Pulse Width Modulation, or PWM, is a technique for getting analog results with digital means. Digital control is used to create a square wave, a signal switched between on and off. This on-off pattern can simulate voltages in between the full Vcc of the board (e.g., 5 V on UNO, 3.3 V on a MKR board) and off (0 Volts) by changing the portion of the time the signal spends on versus the time that the signal spends off. The duration of "on time" is called the pulse width. To get varying analog values, you change, or modulate, that pulse width. If you repeat this on-off pattern fast enough with an LED for example, the result is as if the signal is a steady voltage between 0 and Vcc controlling the brightness of the LED.

Participant Circuit Design:



Actual Waveforms and Area:



Reference Paper:

- *https://www.tandfonline.com/doi/abs/10.1080/00207218808962855?journalCode=tetn20*
- *https://circuitdigest.com/microcontroller-projects/arduino-pwm-with-led-dimmer*