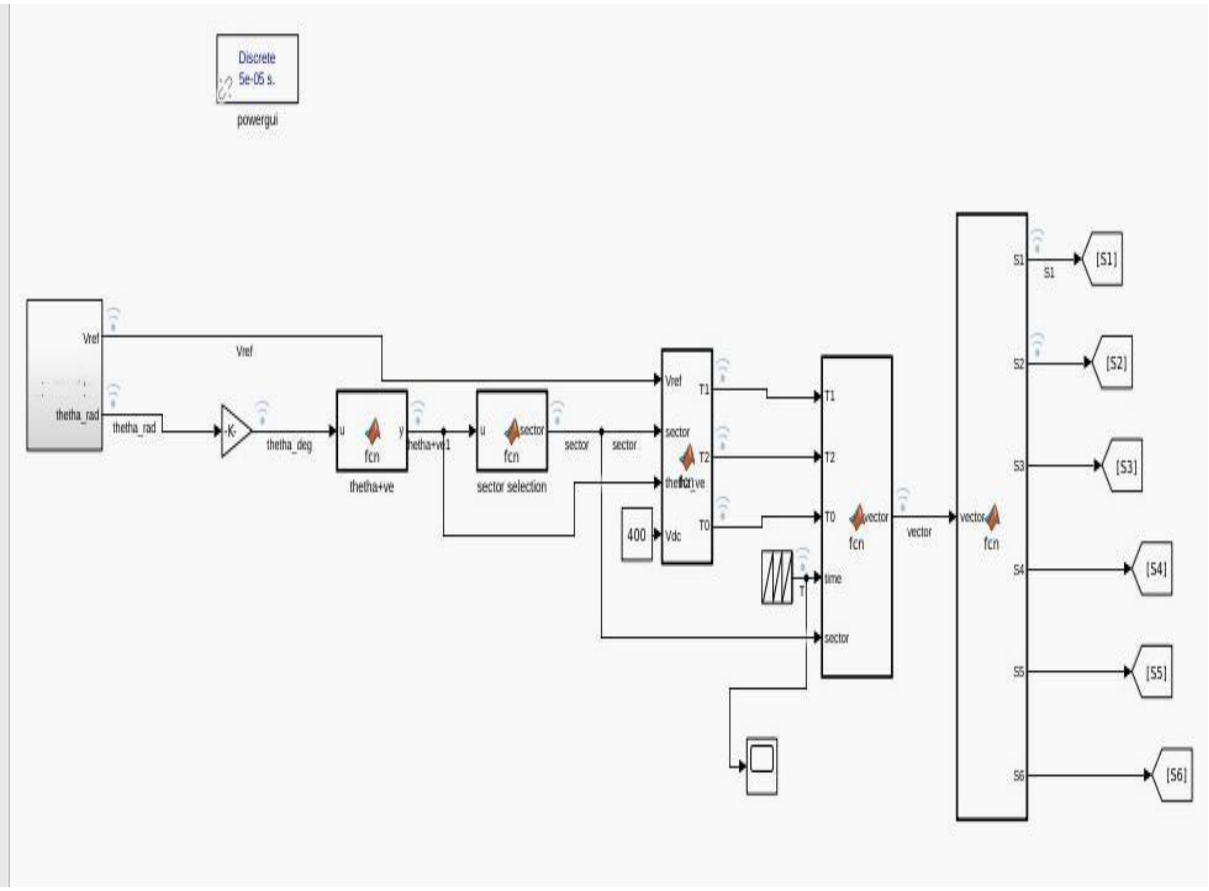
Project report

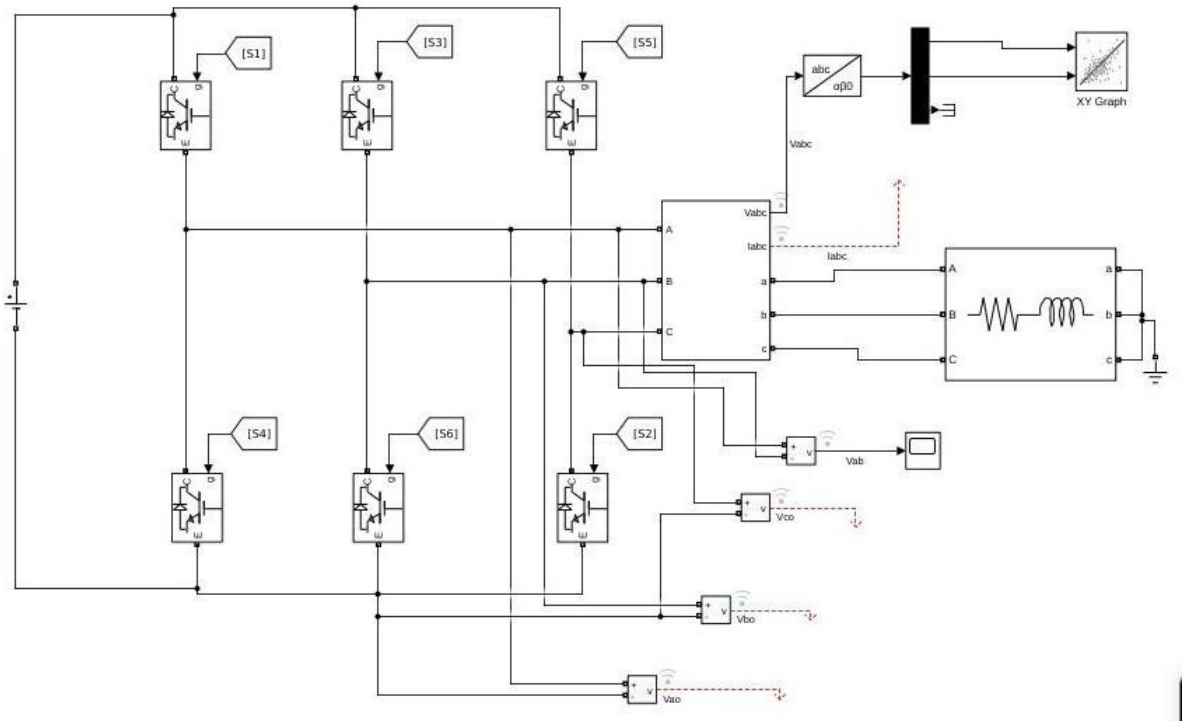
Implementation of SVPWM technique for a 3 phase 2 level VSI in matlab

Objective: Implementation of SVPWM technique for a 3 phase 2 level VSI in matlab and assume an inductive load is connected to the terminal of VSI.
(Use sector selection in range of (0 to 360 degree) and seven segment switching should start from [1 1 1] for all sector.

In this model
Modulating signal frequency=1550Hz
Reference signal frequency=50hz
Vdc=400 Volt
Load parameter
R=1 ohm
L=0.01H

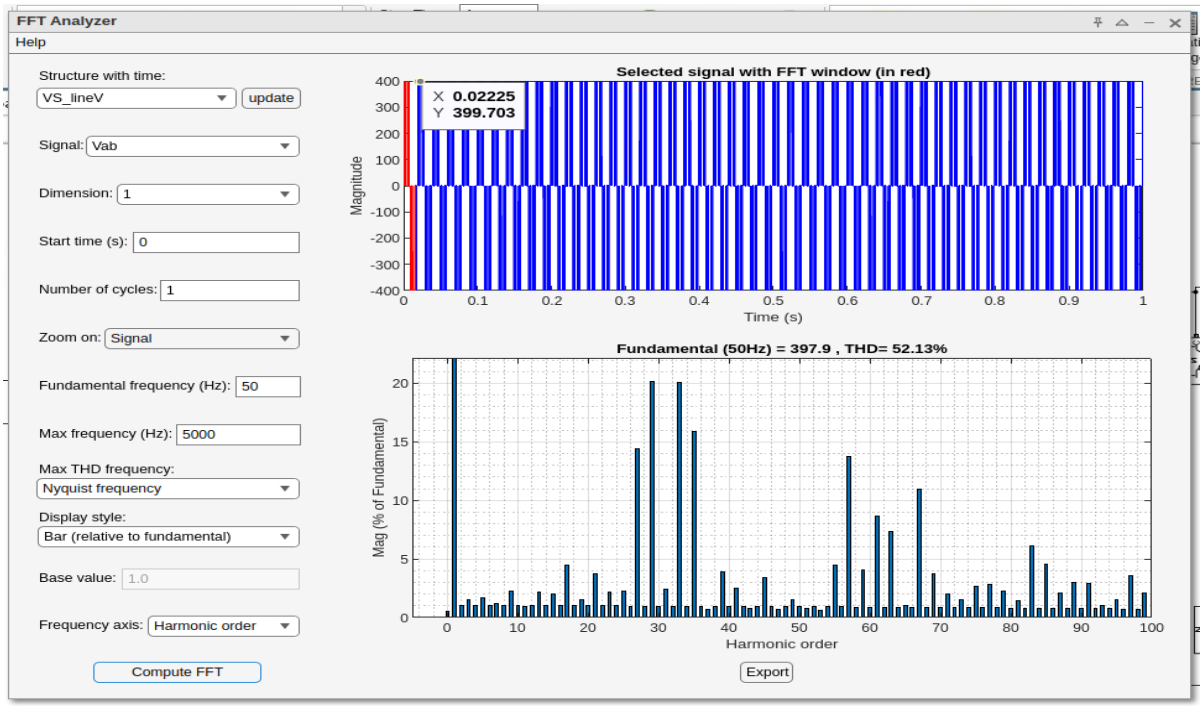
Model To select the sector and Switching pulse accordingly



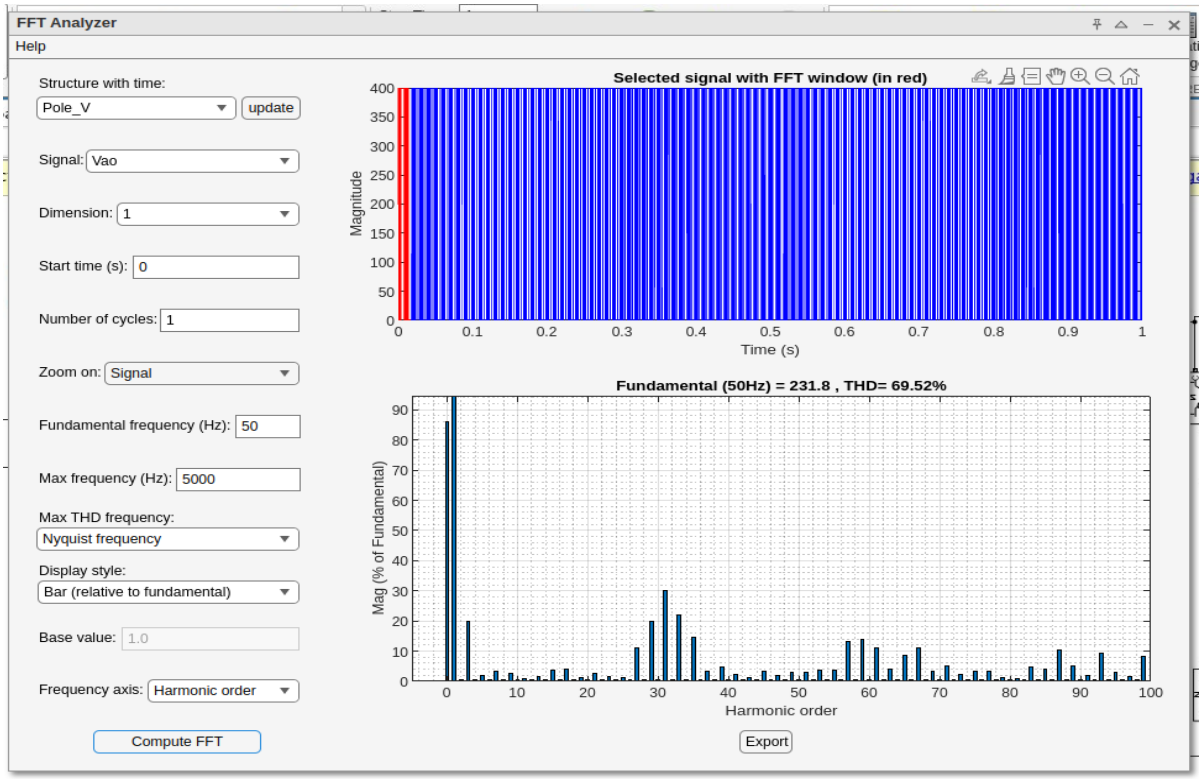


Voltage Source Inverter With the load of R=1ohm & L=0.01H

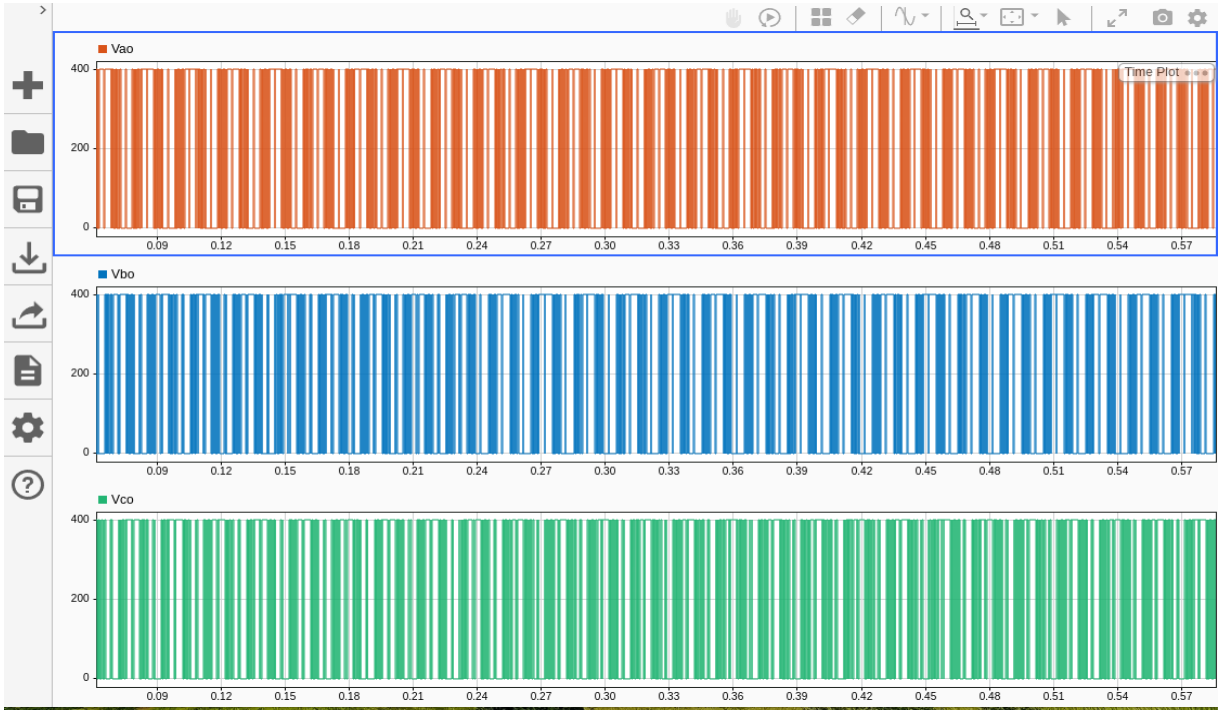
FFT of line voltage Vab (THD=52.13%)



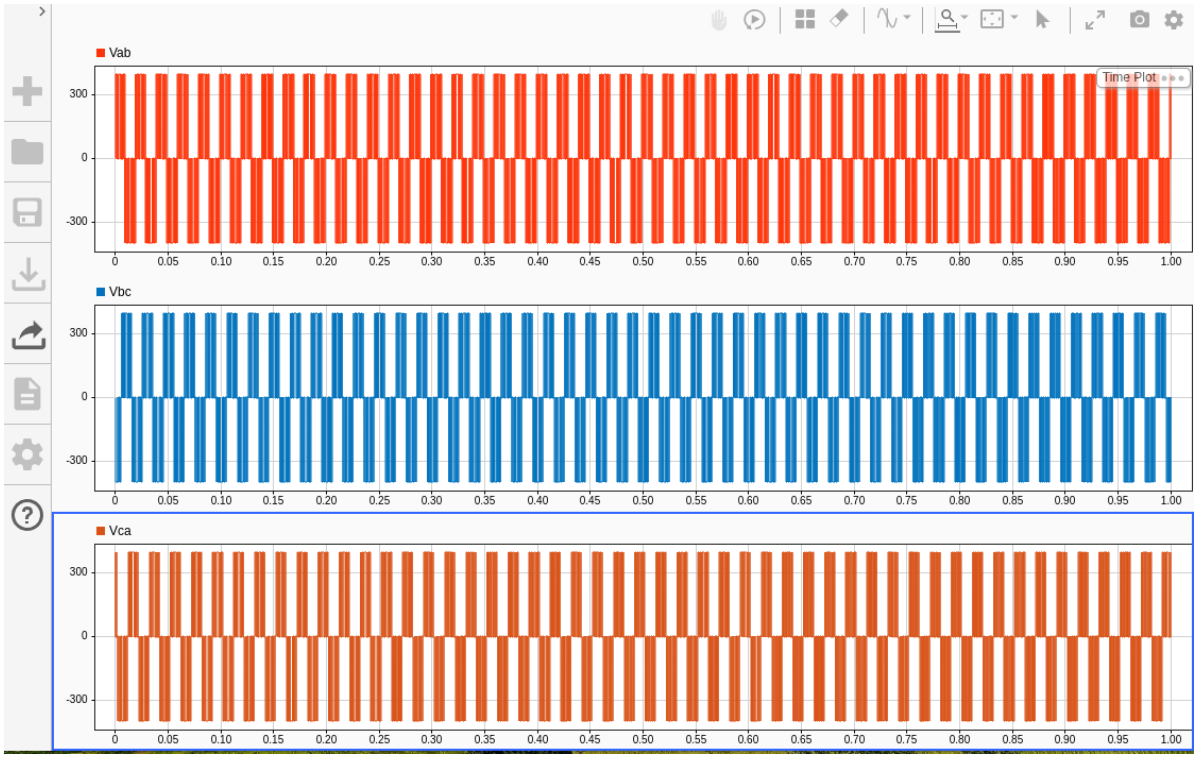
FFT of pole voltage Vao(THD=69.52%)



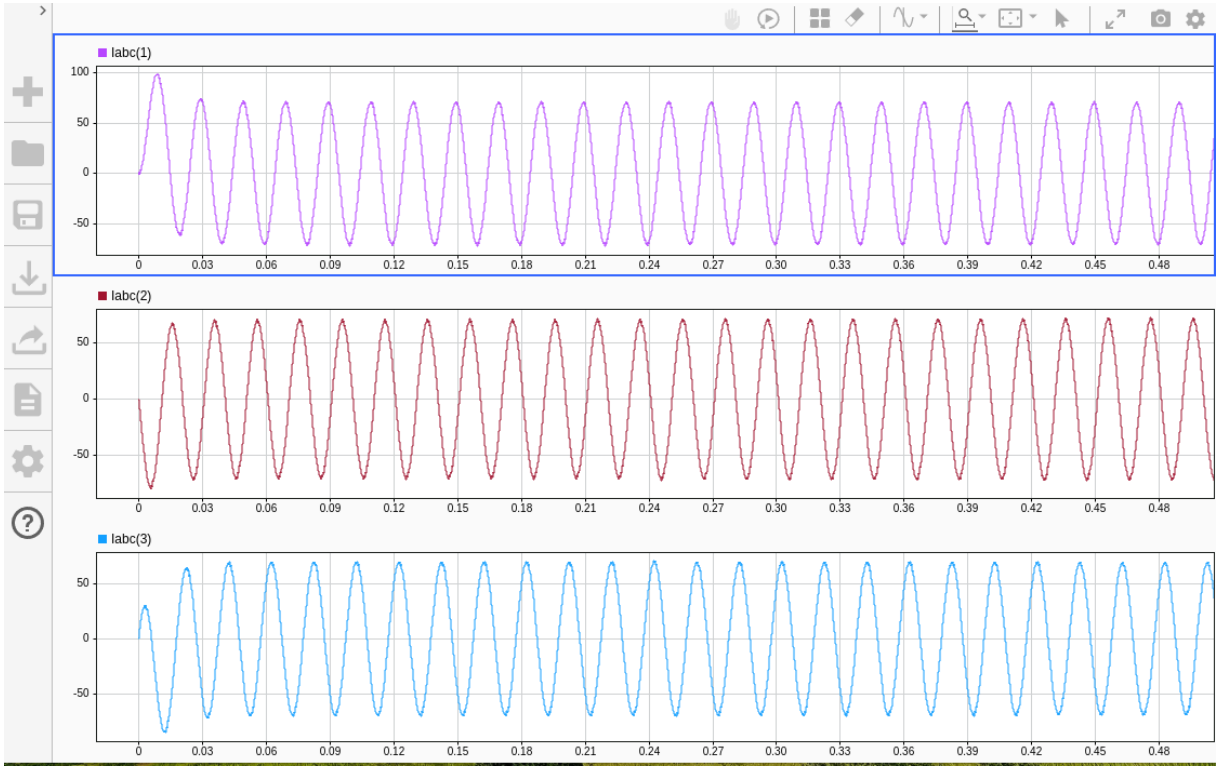
Pole voltages(Vao,Vbo,Vco)



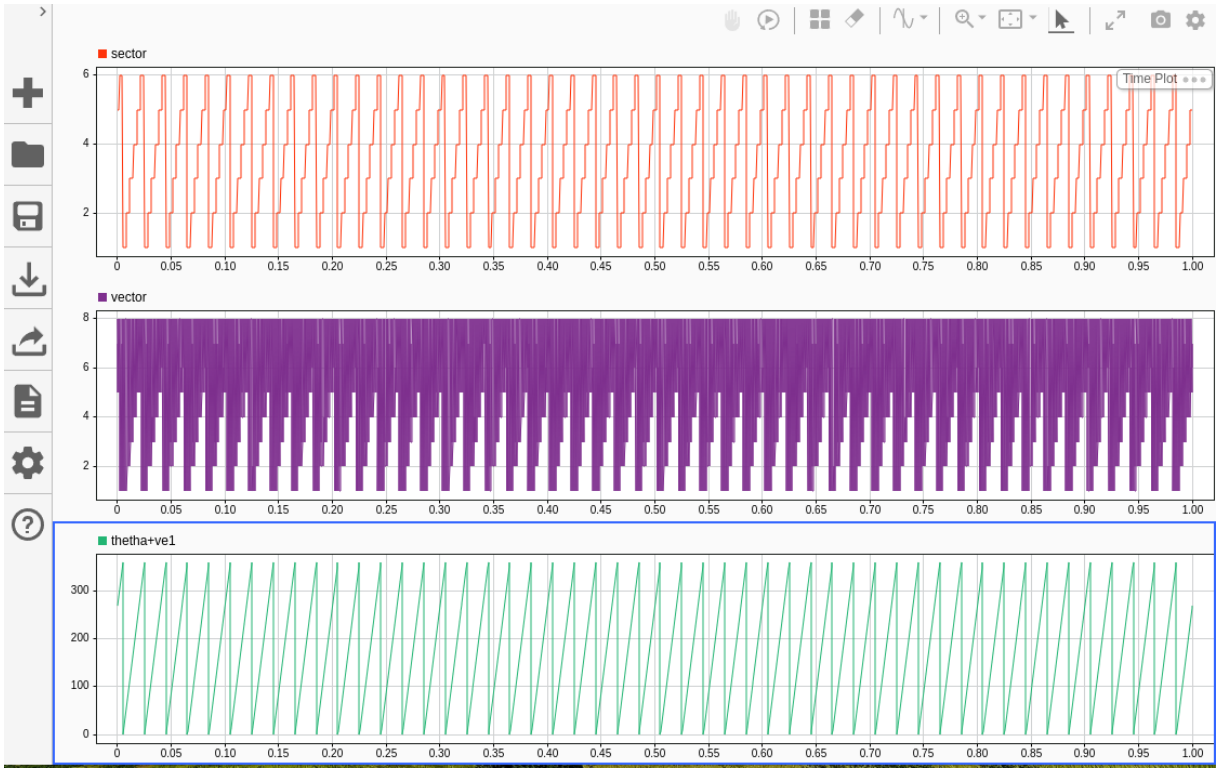
Line Voltage(Vab,Vbc,Vca)



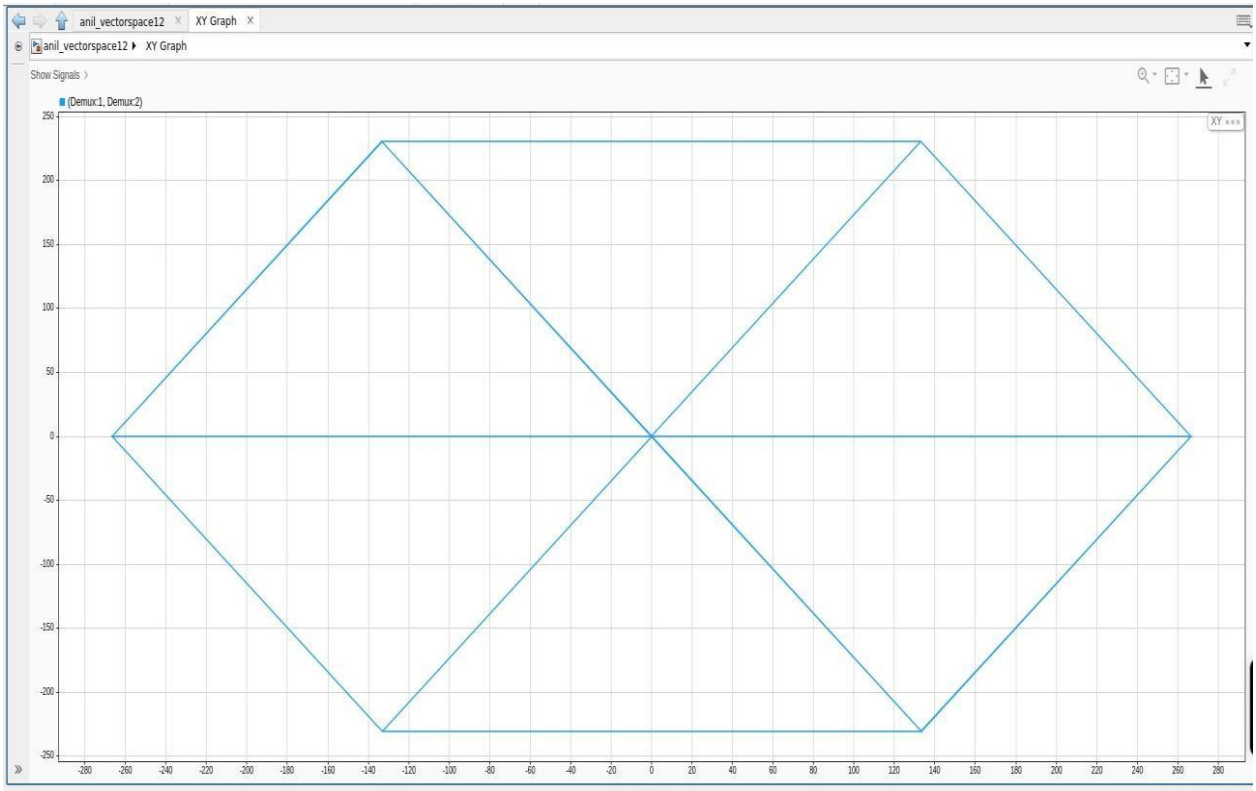
Load Current (Ia,Ib,Ic)



Sector,Vector,thetha



Voltage Space vector diagram for load phase voltage



Useful Observation:-

1. In voltage space vector we are getting 266.66 peak voltage which is equal to (2*Vdc/3)
2. From FFT analysis we can see that total harmonic distortion (THD) is 52.62% Which is significantly low compare to other technique for 2-level inverter
3. from Load current graph we can see that they are in perfect balance 3-phase condition (120 degree shift from each other).
4. from FFT analysis we can see the harmonic order:

   Major harmonic is in order of (27 29 31 33 35)

   Which is equal to (Fs/F±2n=31±2n) where n =0,1,2,..n