

```

20 f_sw = 2500; % - PWM frequency, Hz
21 f_ref = 15;
22 %f_ref = 0.5*f_e % - second required speed

n_ref = 60 * f_ref * (1 - s_n) / z_p [rpm]

23 n_ref = f_ref / z_p * 60 * (1 - s_n) % - second required speed

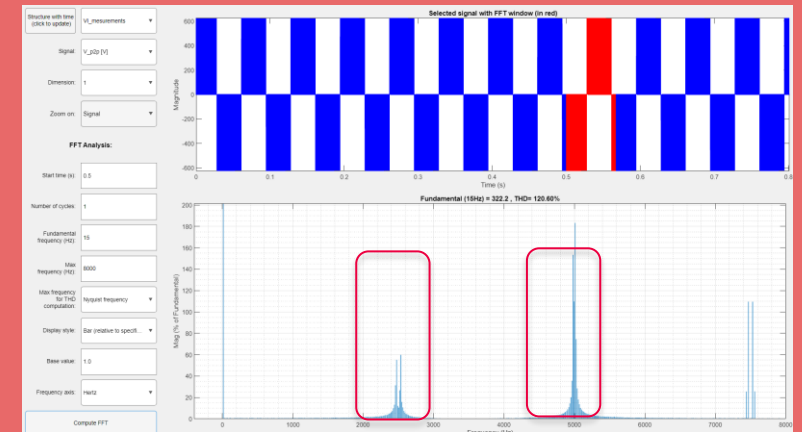
Frequency modulation index
m_f = f_sw / f_e

24 m_f = f_sw / f_e % - Frequency modulation index
    
```

Name	Value
f_e	15
f_ref	15
f_sw	2500

Command Window: `f_x >>`

You may face to this problem of inaccurate frequencies in FFT analysis, and the harmonics could not be clearly seen because of some subharmonics noise



Noisy result at $f_{sw}=2500$ Hz and $f_e=15$ Hz

$$\frac{f_{sw}}{f_e} = \frac{2500\text{Hz}}{15\text{Hz}} = 166,667 - \text{not an integer}$$

```

20 f_sw = 15*167; % - PWM frequency
21 f_ref = 15;
22 %f_ref = 0.5*f_e % - second required speed

n_ref = 60 * f_ref * (1 - s_n) / z_p [rpm]

23 n_ref = f_ref / z_p * 60 * (1 - s_n) % - second required speed

Frequency modulation index
m_f = f_sw / f_e

24 m_f = f_sw / f_e % - Frequency modulation index
    
```

Name	Value
ans	166.6667
f_e	15
f_ref	15
f_sw	2505

Command Window: `>> 2500/15`
ans = 166.6667

To fix that you need to calculate the closest switching frequency which will be integer multiple of your fundamental frequency of rated speed f_e or second reference speed f_{ref} depending on the Lab 6 task

$$\frac{f_{sw}}{f_e} = \frac{2505\text{Hz}}{15\text{Hz}} = 167$$

– f_{sw} is an integer multiple of f_e

