

8.1. Simple step application of the multi sinusoidal disturbances

The simple step of the multi sinusoidal disturbances can be implemented with the Simulink block “multi sinusoidal disturbances” available in the Simulink Simulator of the active suspension. One can specify 1, 2, or 3 sinusoids, their frequencies and magnitude values, the time of application.

Below the protocol for each multi-sinusoidal disturbance is given (the time schedule will be the same for 1 or for 3 sinusoids).

Simple step protocol:

Disturbance amplitude is **0.1V** for each sinusoid.

T=0 no disturbance, closing of the loop

T=5s application of the disturbance (1, 2 or 3 sinusoids)

T=20s suppression of the disturbances

T=30s end of the experiment

As indicated in the chapter “Evaluation of the Adaptive Controller” it is expected that the time sequence will remain the same for all the situations but the values of the frequencies may be changed.

Single sinusoidal disturbance (level 1):

For this level, all the frequencies in the range 50Hz→95Hz are tested (every 5Hz).

Two sinusoidal disturbances (level 2):

For this level, every couple of frequencies in the range: [50-70]Hz to [75-95]Hz are tested (every 5Hz for each sinusoid)

The tested frequencies are:

[50-70]Hz - [55-75]Hz - [60-80]Hz - [65-85]Hz - [70-90]Hz - [75-95]Hz.

Three sinusoidal disturbances (level 3):

For this level, every group of frequencies in the range: [50-65-80]Hz to [65-80-95]Hz are tested (every 5Hz for each sinusoid)

The tested frequencies are:

[50-65-80]Hz - [55-70-85]Hz - [60-75-90]Hz - [65-80-95]Hz.