

PS 1 Report

The Fig1.1 has shown the system response when topic “/frequency” = 1hz, “amplitude” = 10.0, and $K_v = 1.0$ in minimal_controller node.

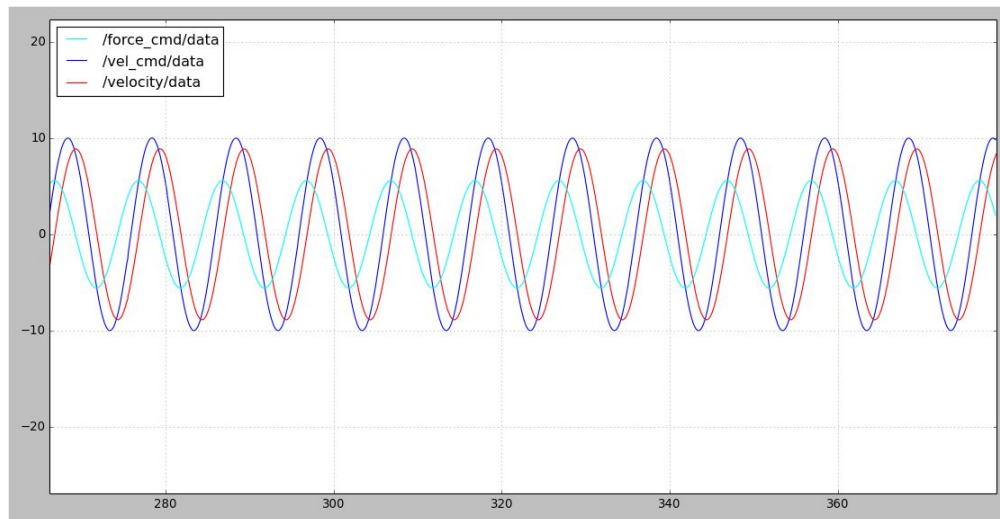


Fig 1.1

Fig 1.2 showed when “amplitude” was changed from 5.0 to 10.0, the “frequency” was still 1 hz.

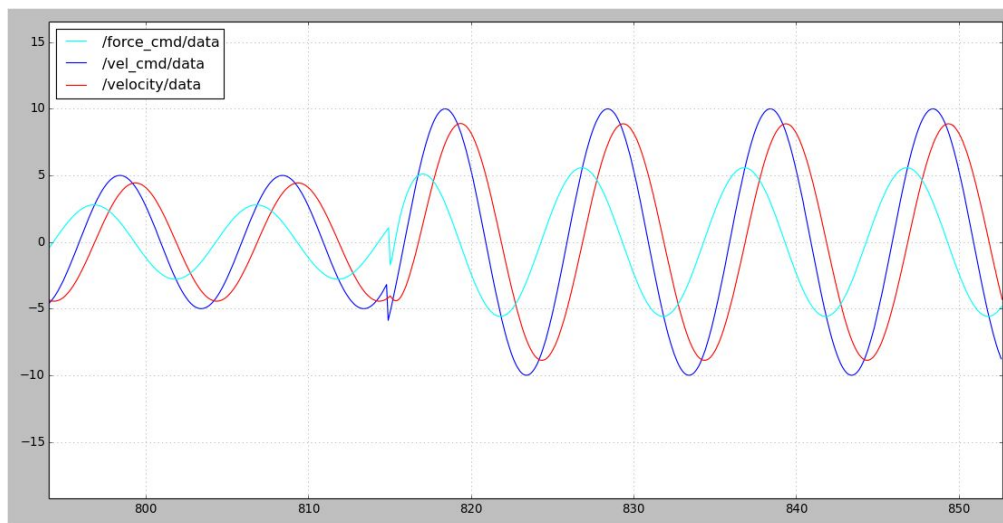


Fig 1.2

From these 2 pictures above, there was time delay between setpoint value of reference signal (“vel_cmd”) and system response (“velocity”), also the reference tracking was not

satisfied. So that by increasing the proportional gain K_v from $K_v = 1.0$ to $K_v = 5.0$, the response of the system was shown below. According to picture, the system performance was improved, better reference tracking and shorted time delay.

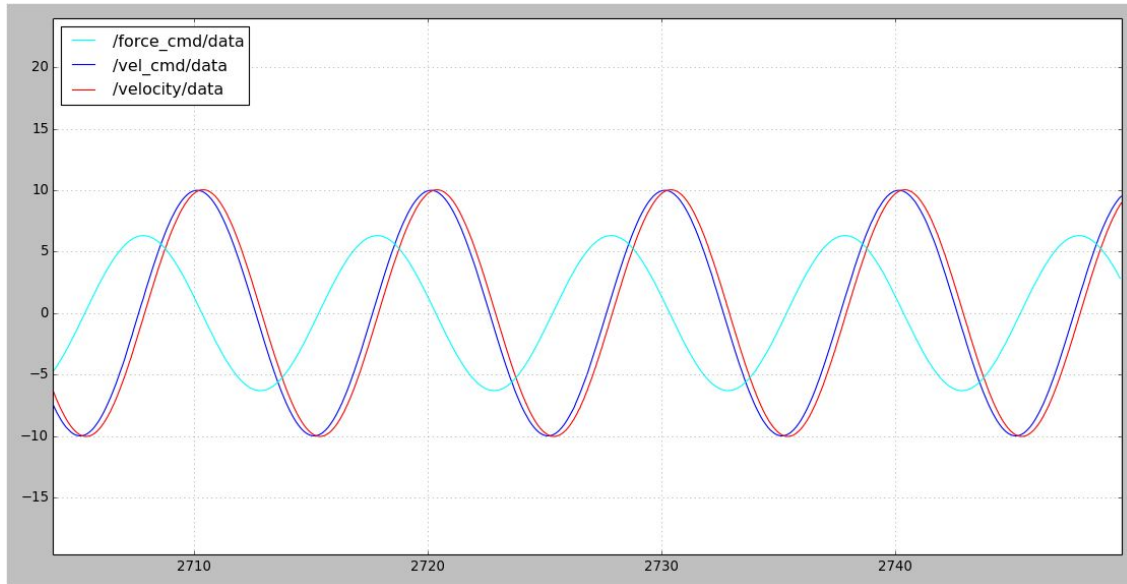


Fig 1.3 When topic “/frequency” = 1hz, “amplitude” = 10.0, and $K_v = 5.0$

By increasing from $dt = 0.01$ to $dt = 0.1$ in minimal_simulator, the system response was also improved, with even better reference tracking and shorted time delay.

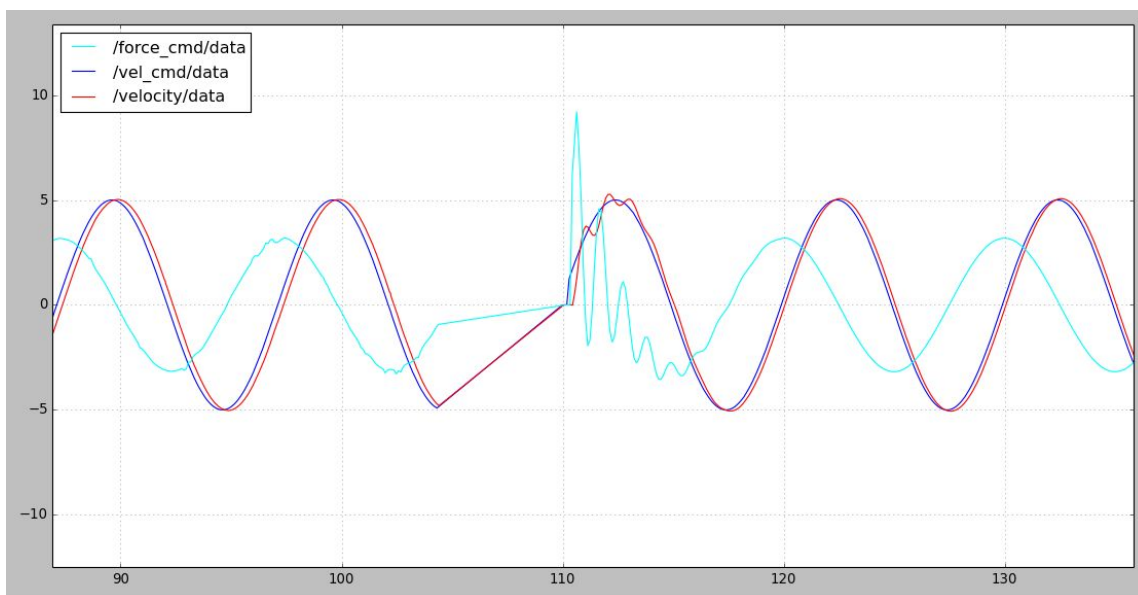


Fig 1.4 When topic “/frequency” = 1hz, “amplitude” = 5.0, and $K_v = 5.0$, $dt = 0.1$

By decreasing to $dt = 0.001$ in `minimal_simulator`, the system response was similar to when $dt = 0.01$, with almost same reference tracking and time delay.

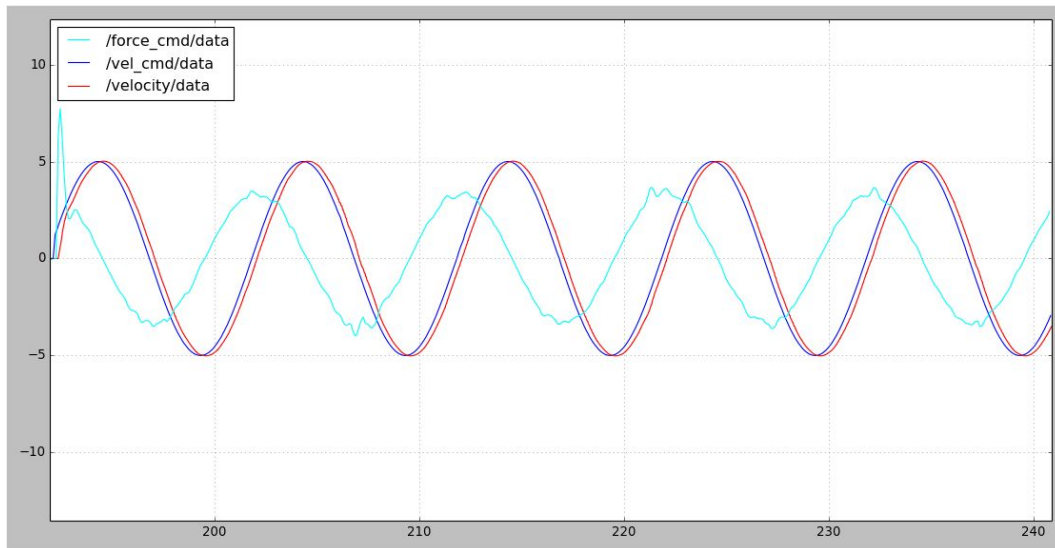


Fig 1.4 When topic “/frequency” = 1hz, “amplitude” = 5.0, and $K_v = 5.0$, $dt = 0.001$

The maximum frequency the system can is 50.0hz, when topic “/frequency” = 50.0hz, “amplitude” = 10.0, and $K_v = 1.0$ in controller, $dt = 0.01$ in simulator. The following picture was shown that when topic “frequency” was changed from 49.9 hz to 50.0 hz. With this change, all the signal became zero.

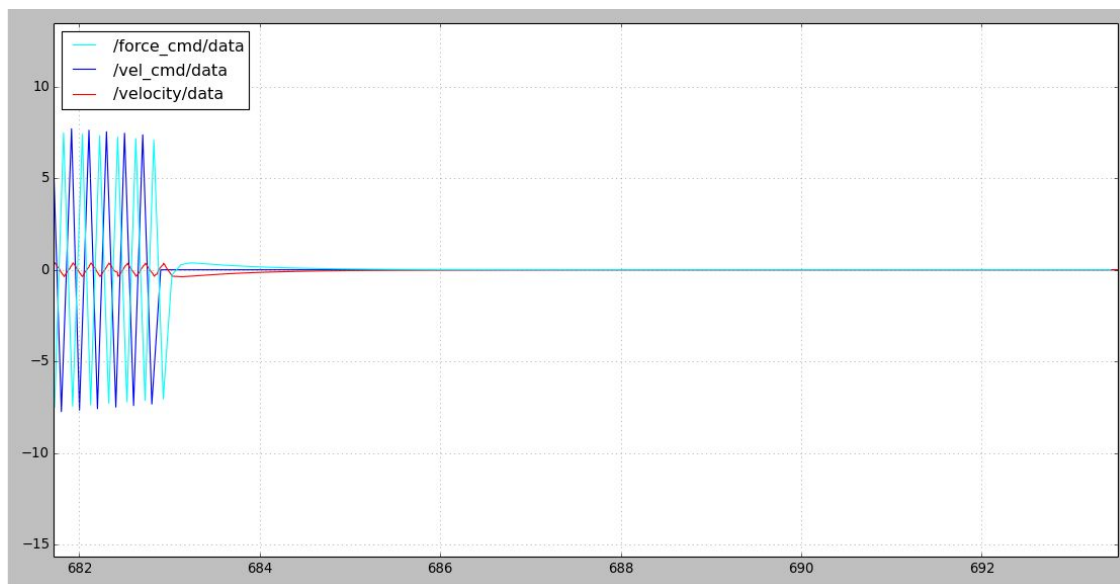


Fig 1.4 When topic “/frequency” = 50.0hz, “amplitude” = 10.0, and $K_v = 1.0$, $dt = 0.01$

