5. Obtained Results and Parameters.

The obtained dynamic parameters are displayed below:

Speed Condition Run	Kinematic Frequency fk	Pulse Frequency ftp	Pulse Per Revolution PPR	Equivalent Conicity λ	Kinematic Wavelength L (m)
Low	1.929	50.09	14	0.49549	1.0255
Medium	3.8511	50.098	7	0.49355	1.0276
High	5.5159	50.071	5	0.51713	1.0038

Table 1 : Acquired Dynamic Parameters At Different Speed Runs.

6. Obtained Numerical Results and Discussion.

The most important dynamic parameters obtained during the low speed, medium speed and the high speed run are summarised in Figure 10. These findings were achieved after the FFT-based analysis of the signal of the lateral acceleration and the estimation of the tachometer frequency based on the detection of the spectral peaks. The pulse-per-revolution (PPR) values were also not given in the raw data and therefore identified using an optimisation routine to determine the most suitable values.

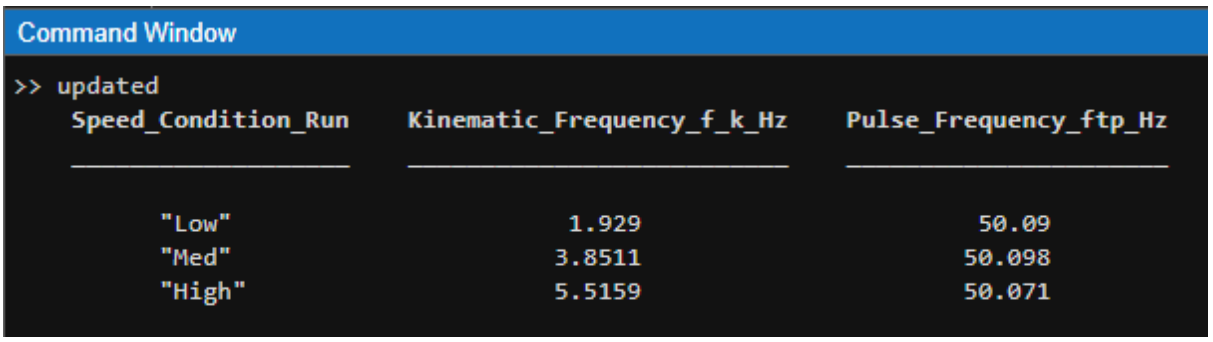

Figure 6.1 : Results of matlab simulation (img. 1st part).

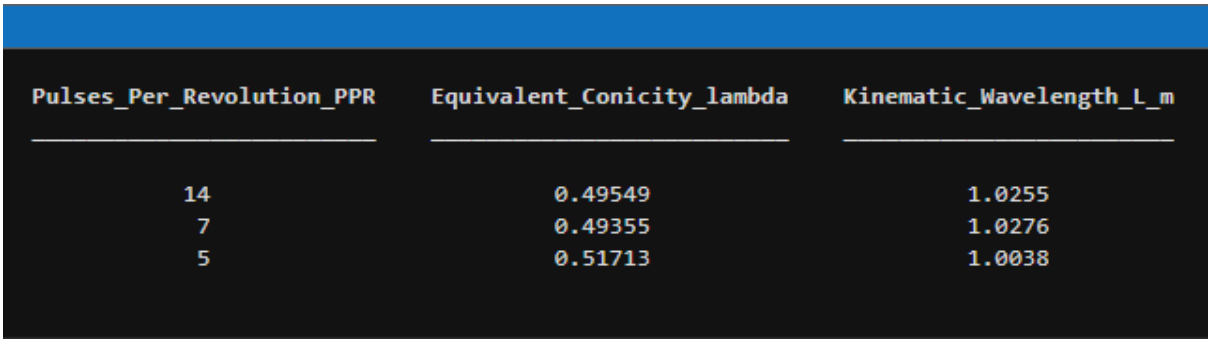

Figure 6.2: Results of matlab simulation (img. 2nd part).

The frequency of the kinematic oscillation (fk) varies with speed, with the frequency being 1.93 Hz at slow speed and increasing to 5.52 Hz at high speed, which is in agreement with theory because the frequency of the kinematic oscillation of a wheelset is expected to rise with speed. Conversely, there is