

Evaluation of vehicle dynamic performance & ride comfort

Overview

By connecting the IMU (Inertial Measurement Unit) to the GPS speedometer, measure the vehicle speed and the vehicle behavior at the same time. It is useful to evaluate vehicle dynamic performance and ride comfort, to which are more paid attention due to the popularization of autonomous driving.



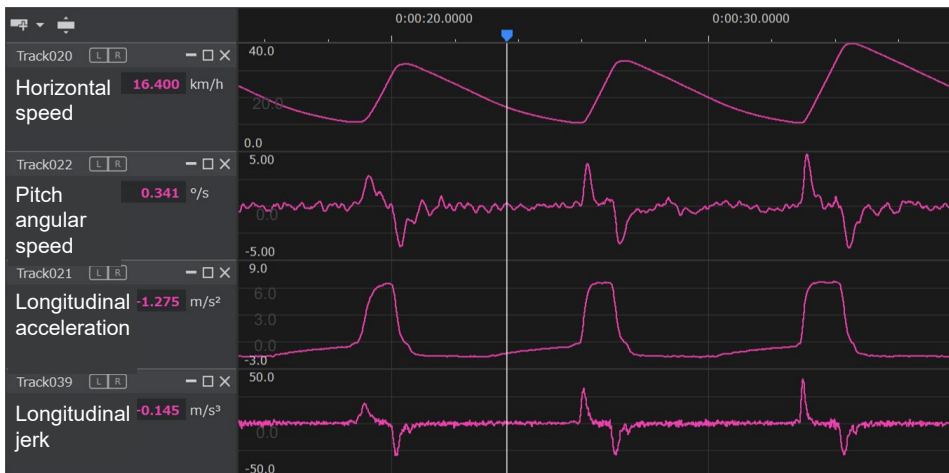
Major measurement items:
 Horizontal speed
 Tri-axial acceleration
 Tri-axial angular speed
 Pitch angle

- Measure the tri-axial acceleration, angular speed with IMU
- Reduce IMU drift with the drift correction

Measurement results

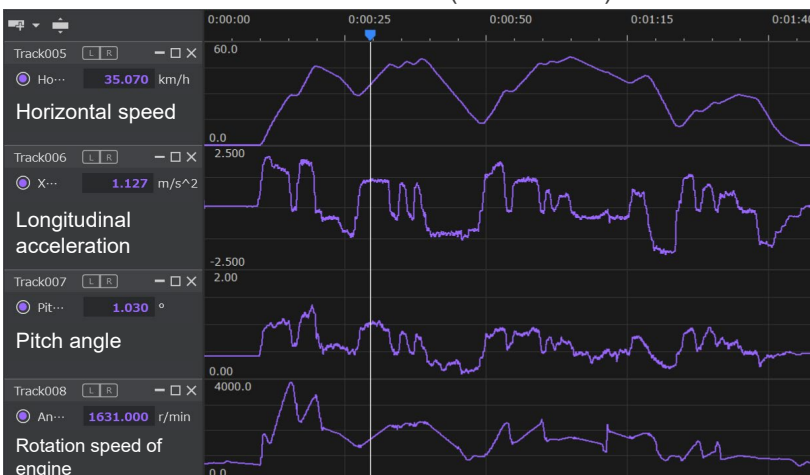
Tipi-in-Tip-out * (10 ⇄ 30 km/h)

*Turn the accelerator ON and OFF while driving with fixed gear.



Using the O-Solution, Time-axis calculus function, take the first derivative with respect to the measured acceleration data and calculate jerk.

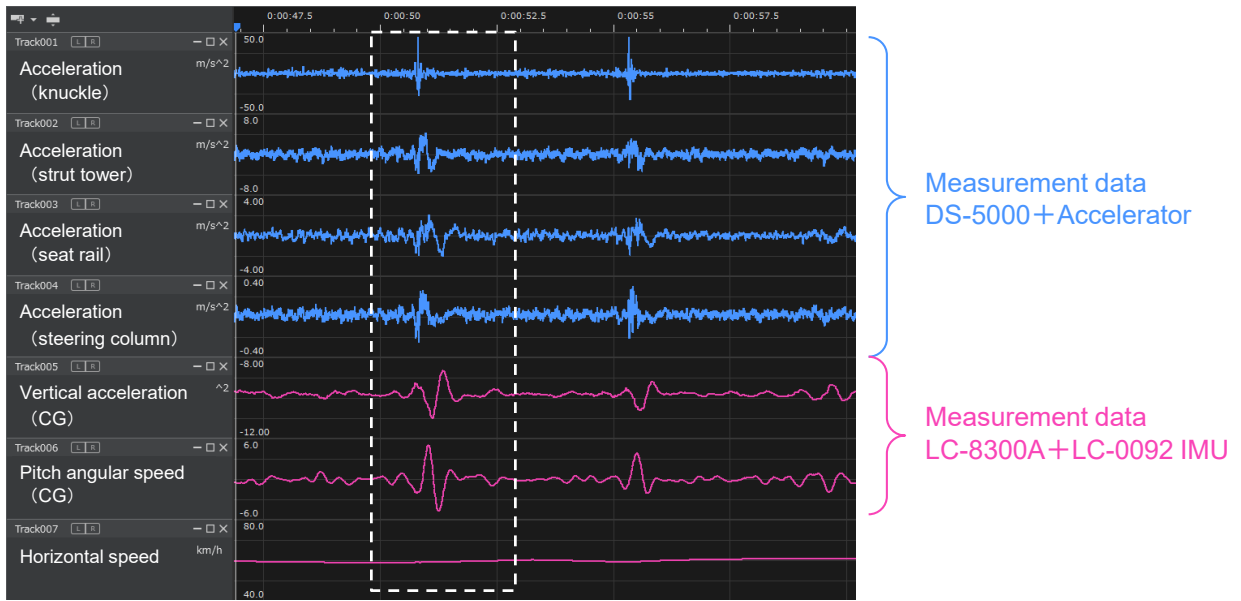
Moderate acceleration/deceleration (0 to 50 km/h)



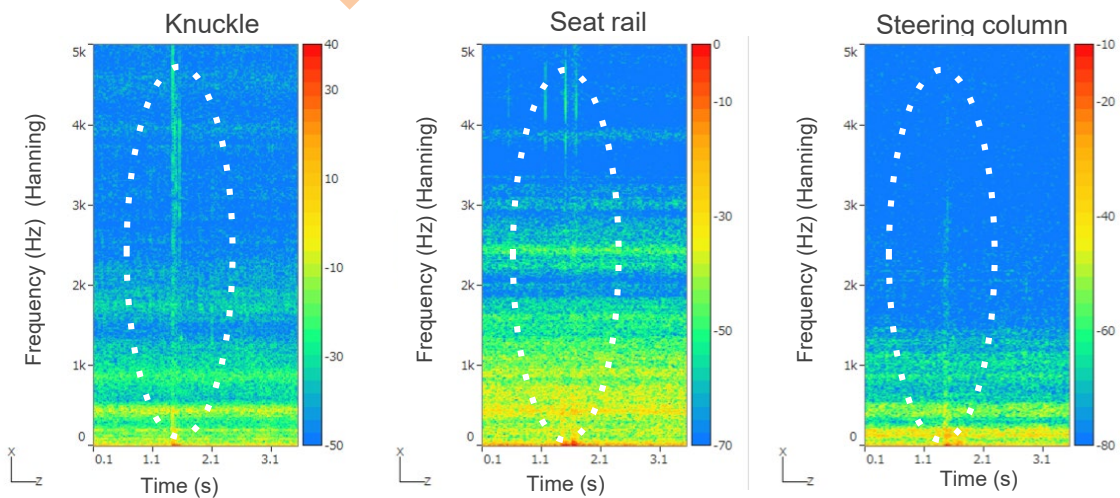
Visualized and analyzed by the O-Solution

Measurement results

Travelling over a bump (60 km/h)



Using the O-Solution, STFT (Short Time Fourier Transform)



System configurations

Model	Product name
LC-8300A	GPS Speedometer
LC-0092	Inertial Measurement Unit (IMU)
LC-0855	High precision IMU
LC-0836	IMU data Output function
LC-0827	Hardware Acceleration Test function
LC-0831	Acceleration/Deceleration Test function
CT-6700	Digital Engine Tachometer
IP series	Engine Tachometer

Model	Product name
DS-5100	Main unit
DS-0526	6ch 40kHz Input unit
DS-0501	Battery unit
OS-5100	O-Solution Platforme
OS-0522	FFT Analysis Function
OS-0527	Time Frequency Analysis Function
NP series	Accelerometer

* Please select detectors according to applications.