

Advanced Ride Comfort assessment on the Driving Simulator

Comfort is now the key performance attribute for vehicle dynamics. People mostly drive in big cities, highways, traffic, etc., and more and more the driving task is getting **automated**. Most of the time people just want to relax and feel comfortable.



Comfort development is still a big challenge, especially in **simulation**. It requires complex vehicle modelling and intricate balancing between conflicting requirements. At the end of the day, a trusted driver is still needed to feel the vehicle and validate the result. And this normally can only be done on a **physical prototype**.

At IDIADA we decided to work on one solution to **take the virtual development of ride comfort to another level**, using the **driving simulator**. Our vision is based on three ingredients.

The first ingredient is the **DiM motion platform**, which replicates precisely accelerations with high amplitude and frequency response – and, importantly, in all directions.

The second ingredient is the **vehicle model: accurate ride comfort requires a high-fidelity, full-scale multi-body model**. This is why we decided to integrate **Simpack** in our DiM. With **Simpack**, complex multi-body models can run on the Real Time computer of the DiM, in a very stable way, even on harsh road inputs.

Last but not least, we need a **physical tyre model, to simulate precisely the tyre-road interaction**. Our long experience and collaboration with **Cosin** made us opt for the **FTire**, which guarantees **high accuracy and real-time performance**.



Once we completed the integration we tested it with our professional drivers: they were impressed. They can really feel a rich and complex ride, especially when driving on IDIADA's high-definition road models.

A driving simulator is a great tool for vehicle dynamics development, but there is a recurrent question around this technology: can we use it to significantly cut the physical development on prototypes? In other words: can we achieve the same performance level with less money and time? Or maybe even a better result?

I believe we can.