



AI Virtual Shock Absorber Evaluation for BEV Tuning

Hitachi Automotive Systems

KEIHIN

SHOWA

NISSIN

are integrated to be

Hitachi Astemo

Powertrain Systems

Chassis Systems

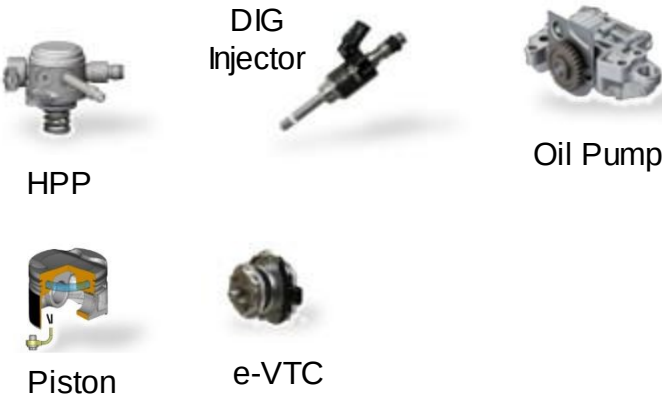
Motorcycle Systems

Autonomous Driving/Advanced Driver Assistance Systems

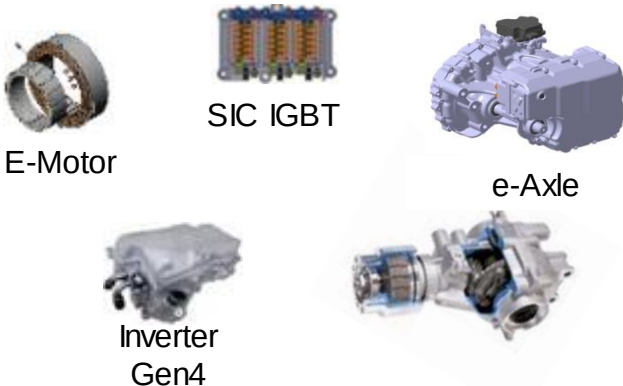
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Advanced
Sustainable
Technologies
for Mobility

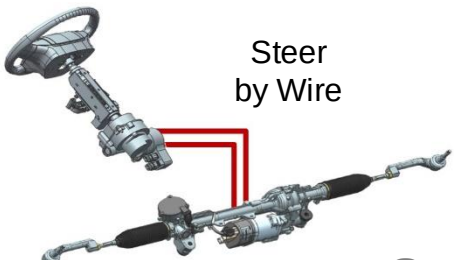
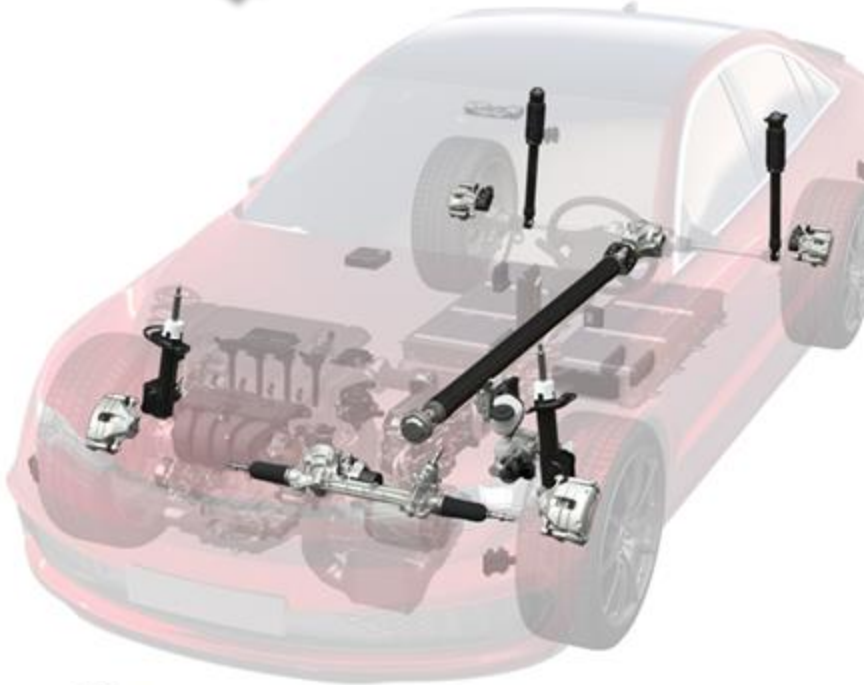
Internal Combustion Engine



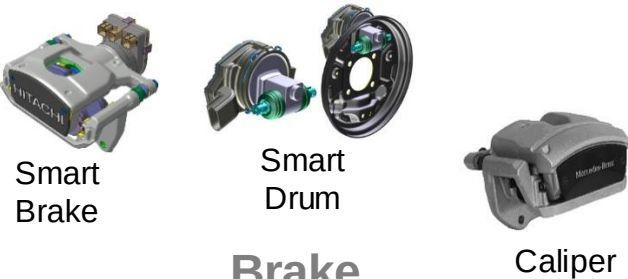
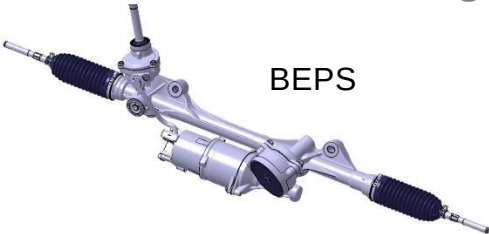
Electric Engine



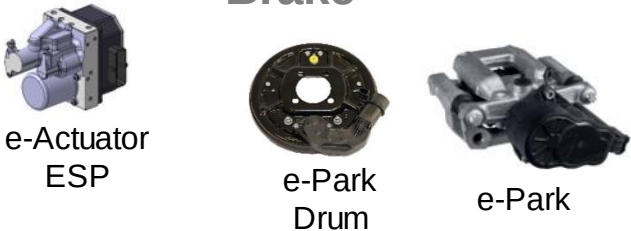
Suspension



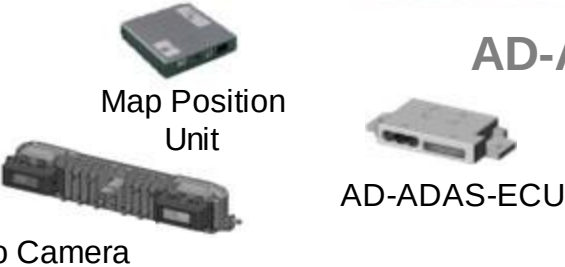
Steering



Brake



AD-ADAS



Automobile Industry need to **reduce Environmental impact**

- **CO2** and **Energy** consumption reduction
- **Sustainable Material** selection
- Development of autonomous driving and Robo Taxis
- Shorten Supplier application **Timing**



Challenges of BEV Technologies for Dampers

Influence on Dampers

Introducing **BEV** is increasing **Vehicle Weight** and new **Chassis Platforms**

Ban of classic Materials:

- Restricting use of chrome 6
- Restricting use of PFAS (Polyfluoroalkyl substances e.g., PTFE)

Focus on **Driving Comfort** than on Handling and Safety

Resulting in a need of **New Technologies** and **Fast Implementation**

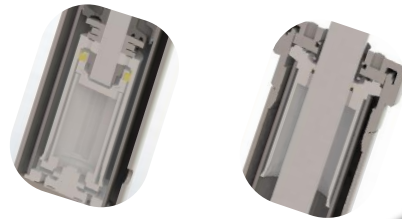


Challenges of BEV Technologies for Dampers

Design Criteria changes
Higher Loads expected
Comfort Increase expected
Noise Reduction expected
Reduce Energy Consumption needed

Hitachi Developed Solutions:

Hydraulic End Stops (HRS HCS)



Frequency Reactive Dampers (FRD SFRD)



New Valve Technologies (HFLS)

Semi active Performance Increase



Implementation of BEV Technologies for Dampers



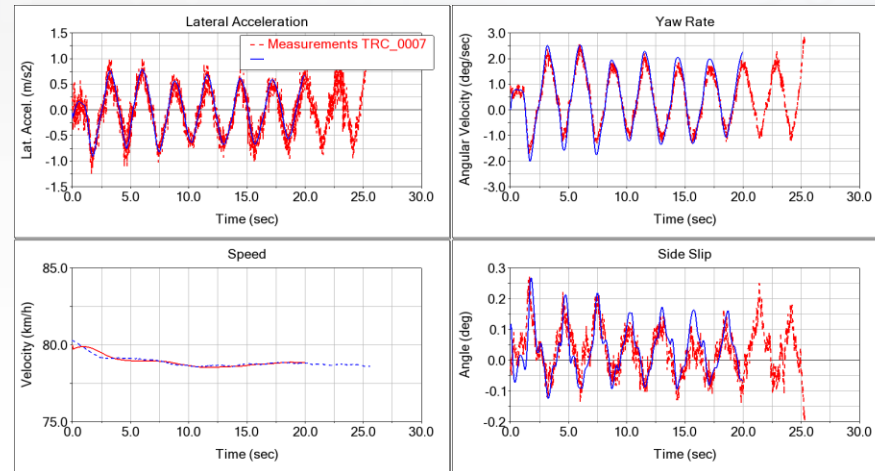
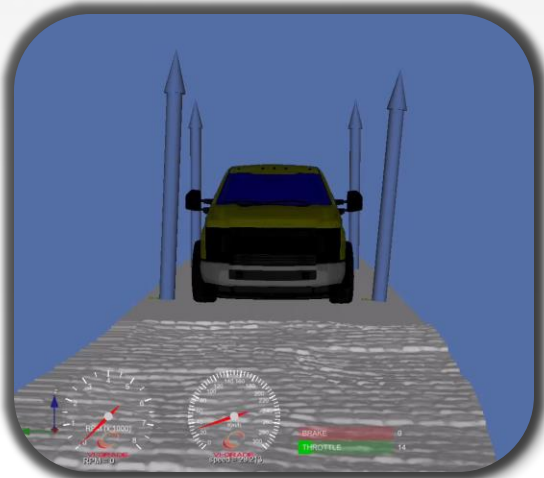
Hitachi Astemo can pick from a wide range of Suspension Design solutions to address the massive ongoing Changes

In a conventional approach many different prototypes were built and evaluated in a time-consuming initial phase

Vast Opportunity to go for Full Virtual Vehicle Simulation

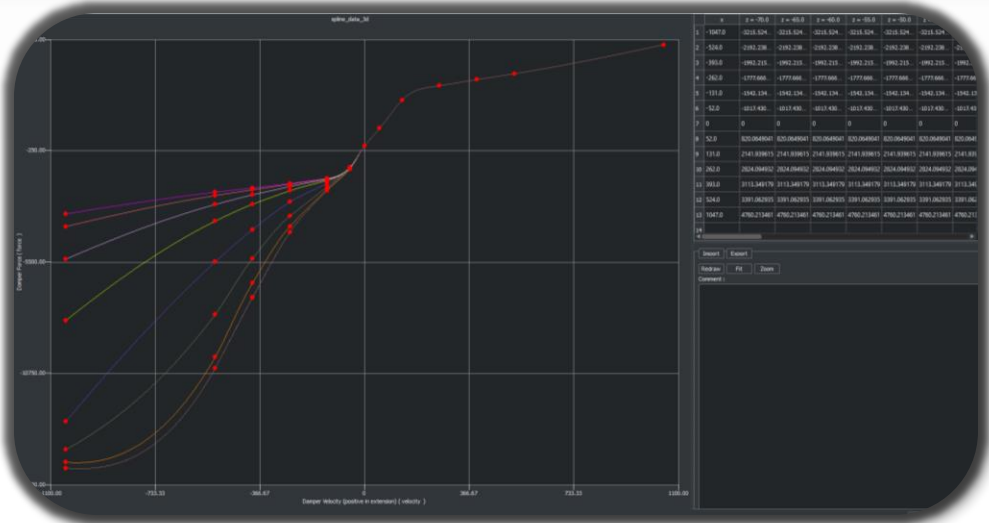
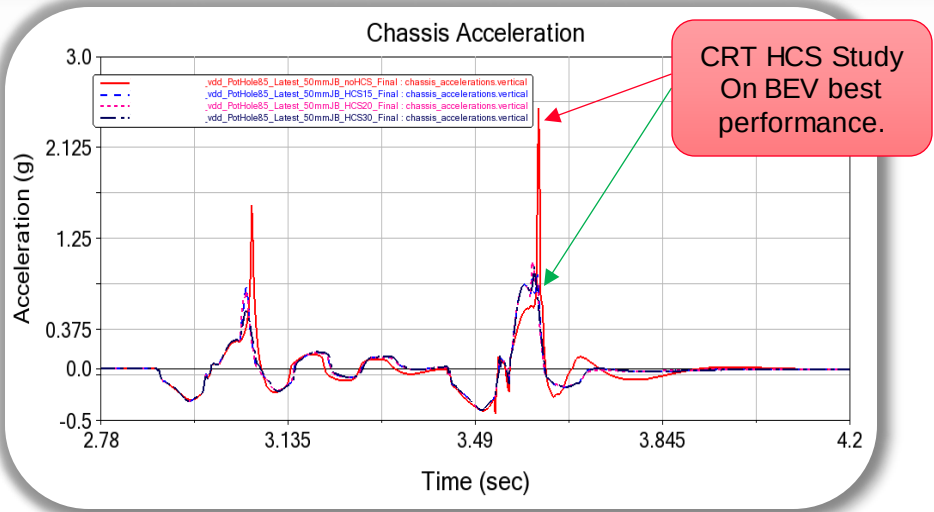
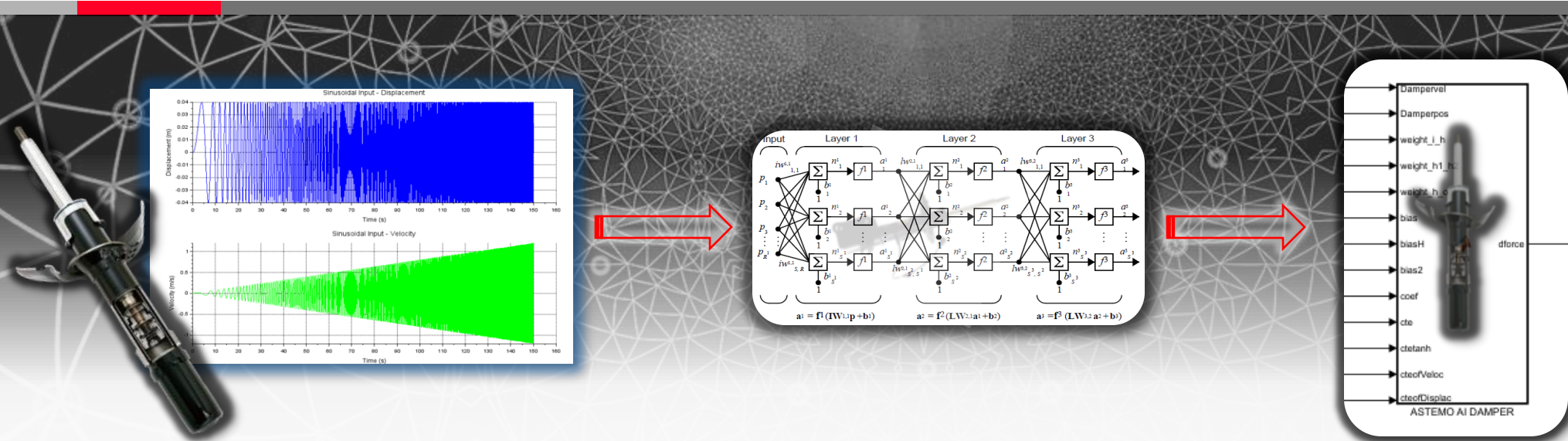
Astemo's Virtual Tuning for Passive and Semi Active Technologies

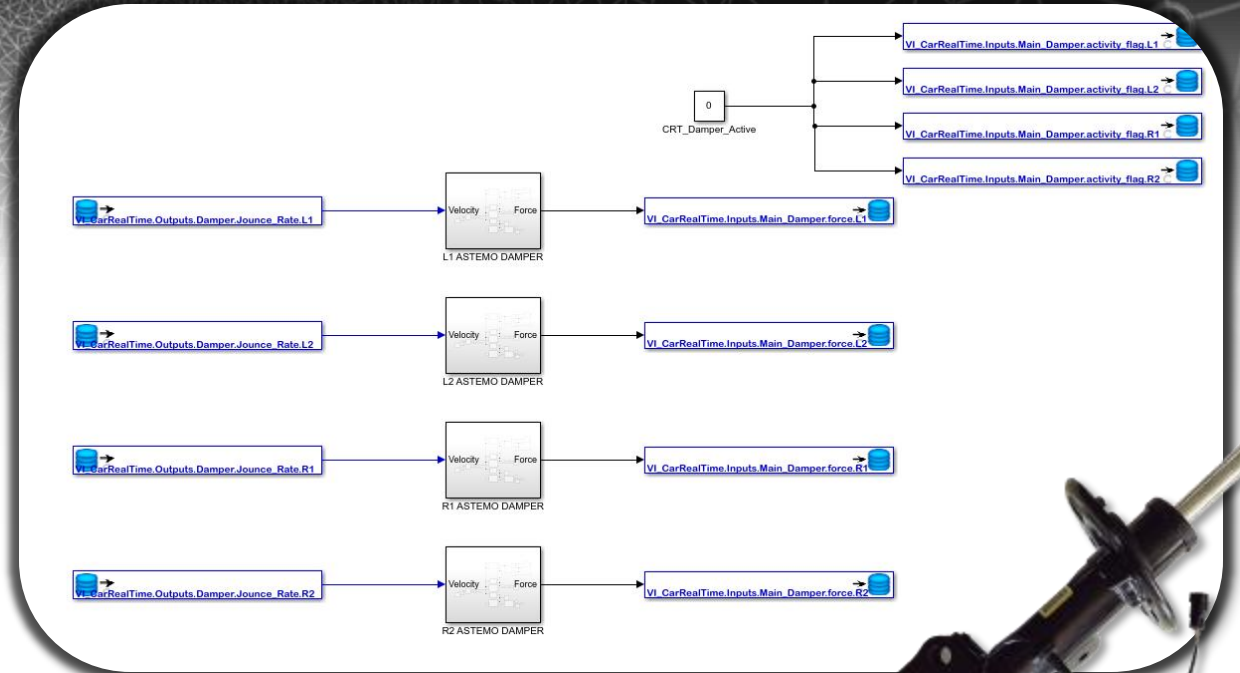
HITACHI
Inspire the Next



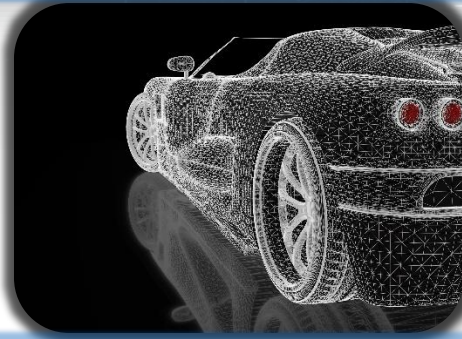
Astemo

Evaluation of BEV Performance Technologies with AI





Deep Learning + Shock Absorbers



Fully Integrated Vehicle With **High End**
Products Developed With
Artificial Intelligence

Semi-Active Technologies aligned with Machine
Learning for ultimate performance both
Virtually and in **Real Life**

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