

# Individual Wheel Torque Vectoring

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## Presentation Outline

1. Vehicle Layouts
2. Enhancement of Vehicle Dynamics in Steady-State Cornering Conditions
3. Compensation of the Interaction between Longitudinal and Lateral Vehicle Dynamics
4. Yaw Rate and Sideslip Angle Control in Transient Conditions
5. Interaction between the Energy Management System and Torque Vectoring Control
6. Torque Vectoring Actuation and Individual Wheel Powertrain Dynamics

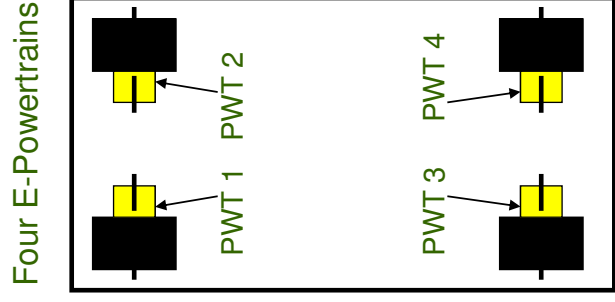
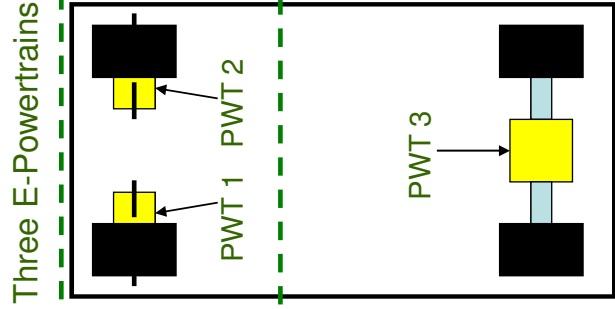
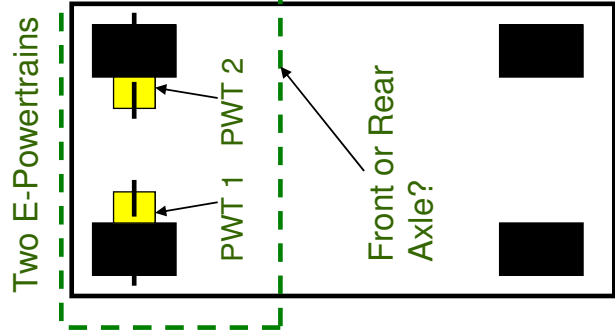


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# 1. Vehicle Layouts

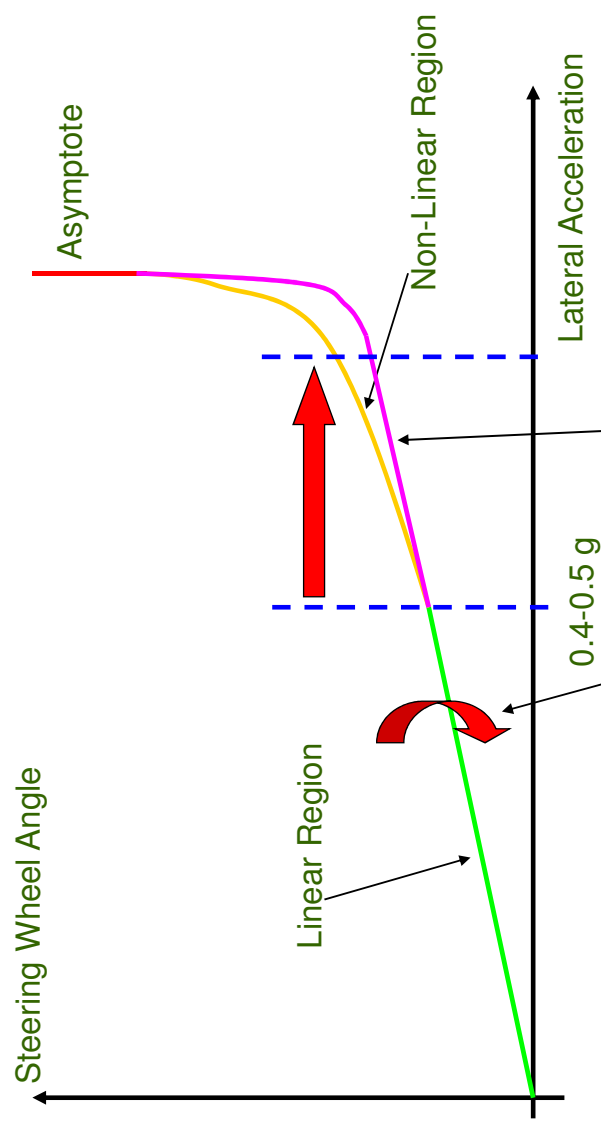
In-Wheel E-Powertrain or In-Board E-Powertrain?



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# 2. Enhancement of Vehicle Dynamics in Steady-State Cornering Conditions



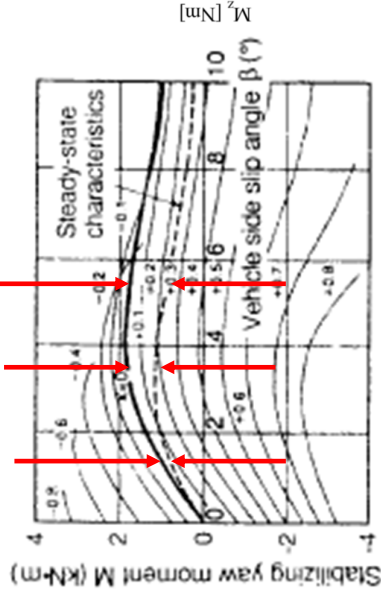
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Possible Effect of Torque Vectoring



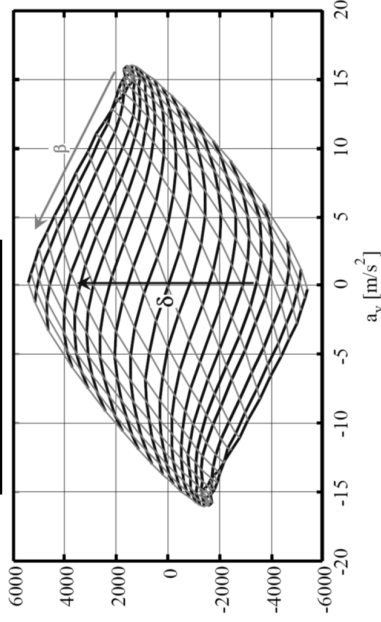
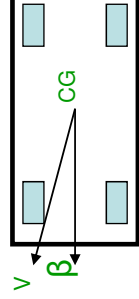
### 3. Compensation of the Interaction between Longitudinal and Lateral Vehicle Dynamics

Vehicle response to steering input changes as a function of the longitudinal acceleration level



a) Acceleration ( $X_G=+1.96m/s^2$ )

Shimada et al., SAE 940870



E. Sampo', Univ. of Surrey, 2008

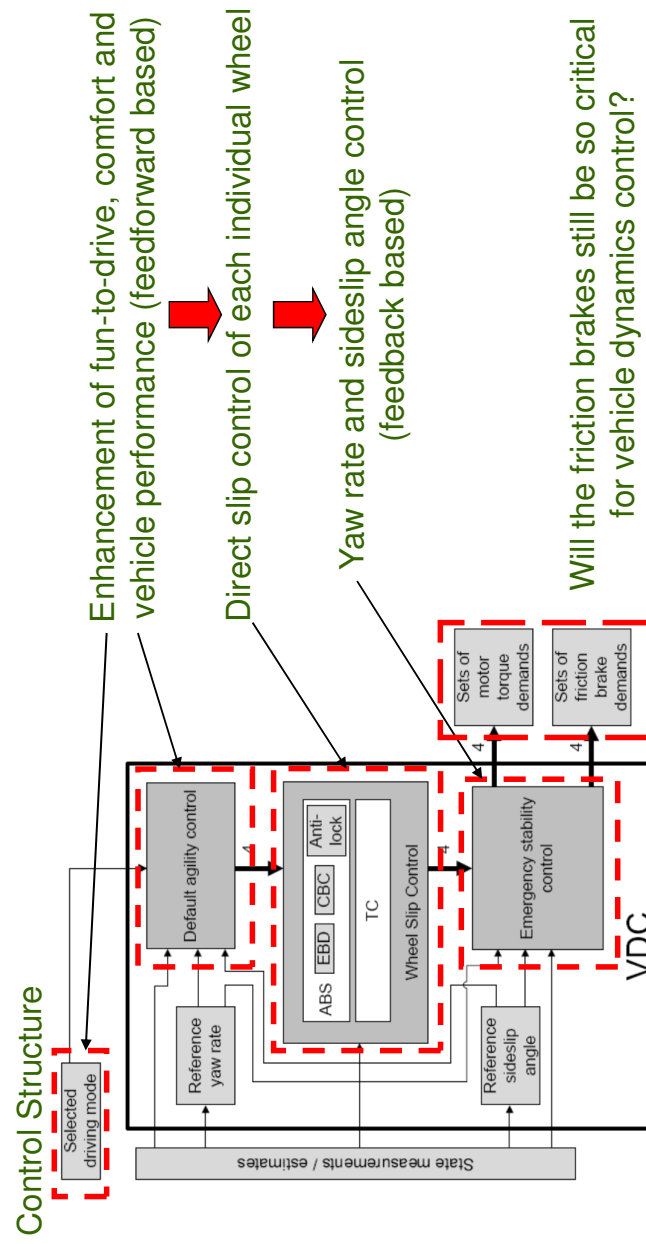
The extensive adoption of the carpet plots will permit the objective evaluation and design of individual wheel torque vectoring control systems



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### 4. Yaw Rate and Sideslip Angle Control in Transient Conditions



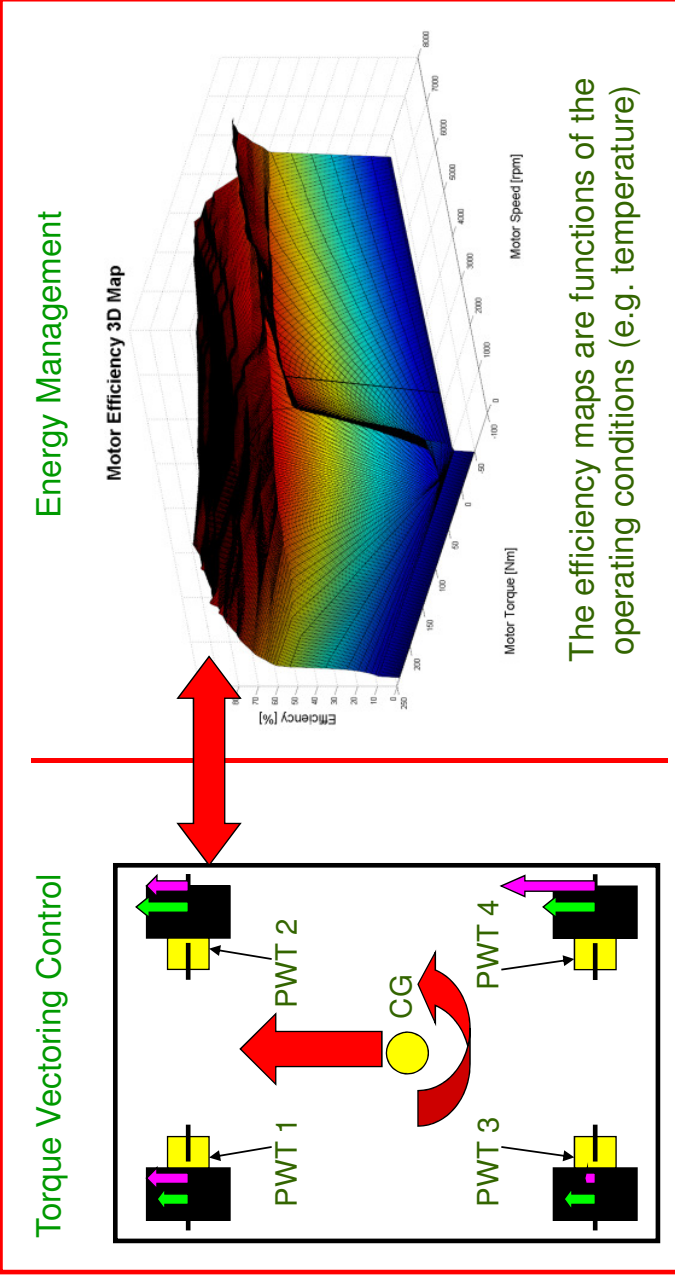
Will the friction brakes still be so critical for vehicle dynamics control?



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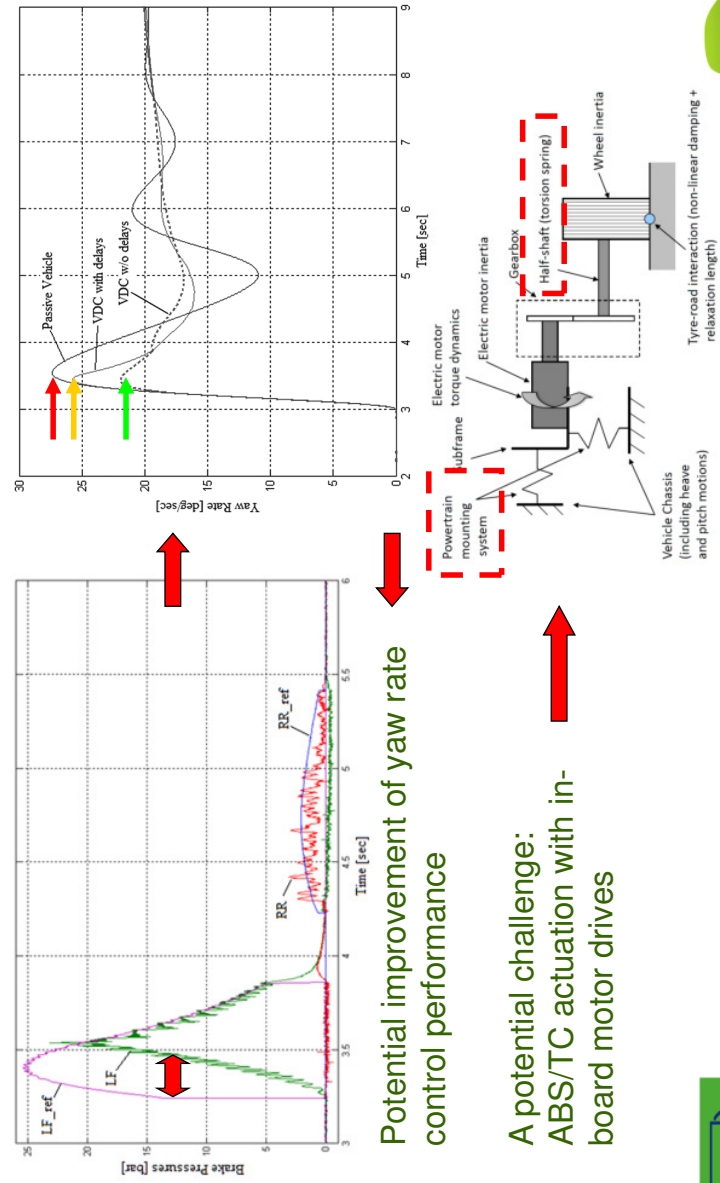
# 5. Energy Management and Torque Vectoring Control



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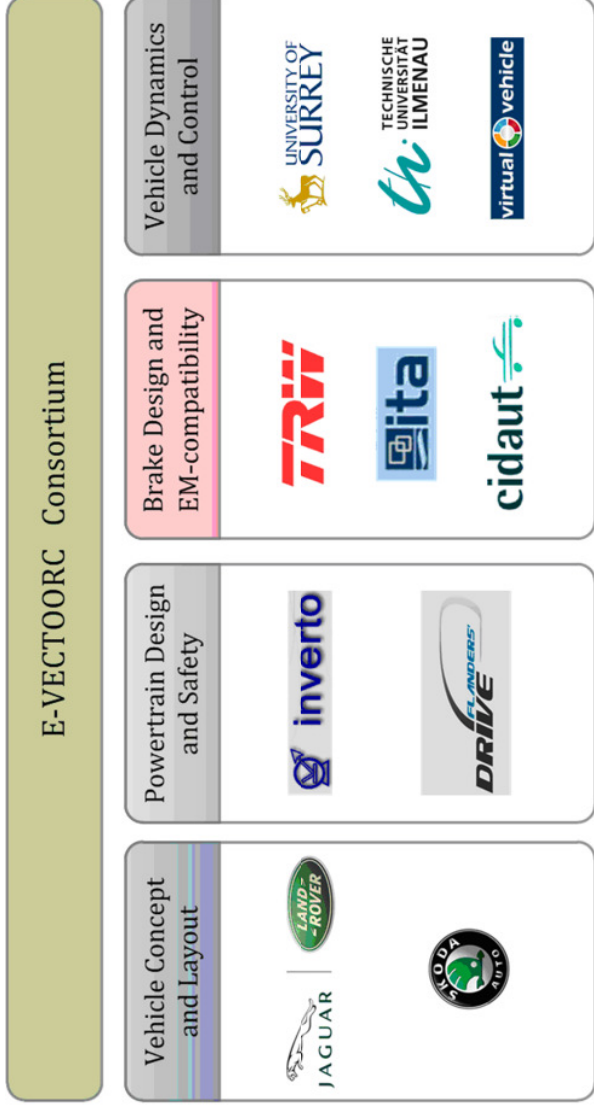
# 6. Torque Vectoring Actuation and Individual Wheel Powertrain Dynamics



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# Any Questions?



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