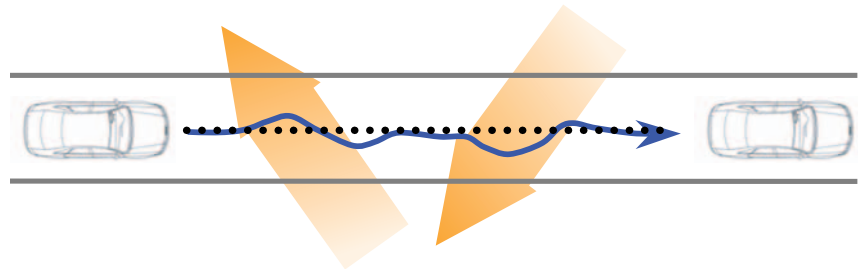


# Prediction and Evaluation of the Driver's Response to Crosswind Excitation

Stochastic crosswind excitation causes vehicle reactions. The driver needs to compensate permanently, which results in comfort restrictions. The crosswind excitation, however, can't be qualified by means of vehicle reactions only. The driver's subjective assessment is also due to criteria like "efficiency of his steering actions", "steering activity needed to keep the track", etc.

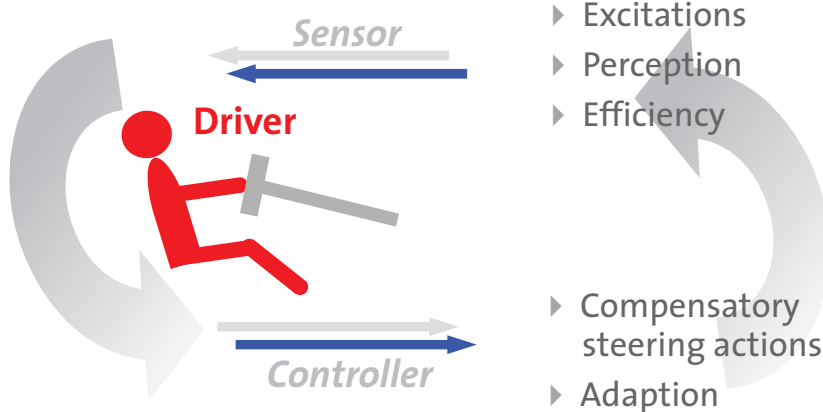


Natural, stochastic crosswind excitation

characteristics, i. e. his steering actions display even slight variations of the vehicle characteristics. That makes it possible to use the driver as a "sensor" and to derive his subjective assessment from his compensatory steering actions.

the driver's subjective assessment already in an early stage of vehicle conception.

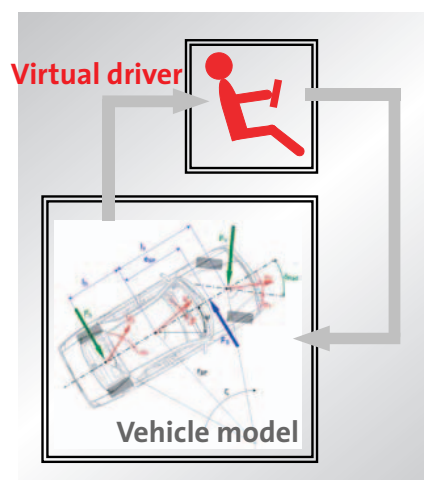
These investigations interrelate aerodynamics, vehicle dynamics and control engineering to an effective simulation tool. The aim is not to minimize the vehicle reactions due to crosswind excitation, but to optimize the driver-vehicle combination.



Driver's role in the vehicle

To conclude the driver's subjective assessment, an approach interrelating all criteria perceived by the driver is used. The essential factor within this approach are the driver's steering actions when compensating for stochastic crosswind. The driver adapts his steering behavior to the vehicle

Additionally, a virtual driver, reflecting human behavior and human adaptation to different vehicles serves as a simulation tool to predict the driver's compensatory steering actions. In other words: The interaction of driver and vehicle under stochastic crosswind can be simulated and evaluated in terms of



Driver-Vehicle-System