



## Model-based Vehicle Dynamics Control

By Sergiy Antonov

Shaker Verlag Jan 2009, 2009. Taschenbuch. Condition: Neu. Neuware - In this thesis, a new model-based vehicle dynamics approach is developed. A modular control structure is achieved by introducing the following layers: lateral dynamics control, control allocation, calculation of vertical tire forces, and wheel control. The interfaces between the layers are realized by means of physical variables and allow an efficient interaction with other control systems, e.g., the anti-lock braking system. The model-based control design traces back to the model reference control technique and exploits the flatness property of the nonlinear one-track vehicle model. The vehicle dynamics control is tackled as a trajectory tracking problem for the lateral vehicle velocity, which is closely related to the body side-slip angle. The aspects of the practical implementation as well as vehicle tests are discussed in detail. Most notable are the very good control performance, allowing to precisely maintain the desired body side-slip angle, and the straightforward control tuning, both achieved by using only the standard ESP (Electronic Stability Program) sensors and actuators. 112 pp. Englisch.

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