

A Modelling Technique for Fast Computer Simulations of Configurable Vehicle Systems

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Computer simulations have become very popular in the automotive industry. To develop and enhance control systems and to optimize model parameters, easily configurable vehicle models with a good run-time performance are needed. To minimize the computational effort the vehicle is modelled by a non-perfect multi body system where the specific vehicle structure is taken into account. The vehicle model is separated into subsystems having a functional skeleton and consisting of several configurable modules. The numerical solution is done by a modified implicit Euler-Algorithm which guarantees sufficient accuracy and numerical stability. The generic model architecture makes it possible to describe nearly all kind of road vehicles, passenger cars, trucks and busses, as well as tractor semitrailer and tractor trailer combinations. The presented modelling concept is realized in the product ve-DYNA applied world wide by automotive companies and suppliers. A computer application shows the efficiency of this modelling concept.

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