M. Arnold, A. Carrarini, A. Heckmann, G. Hippmann

Abstract. Simulation in vehicle system dynamics has its historical origin in the analysis of the purely mechanical behaviour using mechanical multibody system models. In multibody dynamics very efficient numerical methods for the evaluation and for the time integration of the equations of motion are available. These methods have been extended step-by-step to more complex engineering systems that may contain, e. g., flexible bodies and mechatronic or adaptronic devices. Multidisciplinary problems like the interaction of mechanical and hydraulic components or the interaction of vehicle dynamics and aerodynamics are handled conveniently by co-simulation techniques. The present paper summarizes some of these recent extensions of classical multibody dynamics such as multifield problems in the simulation of adaptronic devices, advanced models of contact mechanics and coupled problems including multibody dynamics, aerodynamics and structural mechanics.

Contact: `martin.arnold@mathematik.uni-halle.de`