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Advanced numerical methods for co-simulation algorithms in vehicle system dynamics. In: Proc. of 1$^{\text{st}}$ Fraunhofer Conference on Multiphysics Simulation, Bonn, Germany, June 22–23, 2010.

Abstract. Co-Simulation algorithms exploit the typical modular structure of multidisciplinary problems in all stages of the simulation process (preprocessing, time integration, postprocessing). Restricting the data exchange between subsystems to discrete synchronization points, the subsystems may be integrated separately by different specially tailored solvers in different simulation tools. Co-Simulation is attractive from the viewpoint of model setup but robustness and efficiency of the resulting numerical techniques for the coupled multidisciplinary problems are today still far away from the state-of-the-art in classical monolithic simulation tools. In the present paper, we discuss a linearly implicit stabilization technique and basic components of a reliable macro stepsize control in co-simulation.

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