

Necessity of formulation of two dynamic models for HMM application to multibody systems

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It is investigated the solution of multibody systems described by differential algebraic equations by reformulation into highly oscillatory ordinary differential equations. It is considered the solution by the application of heterogeneous multiscale methods (HMM). On this example it is demonstrated the necessity to use formulation of two level dynamical models for successful application of HMM. These models must differ by their eigenvalues. It is not necessary to formulate both models explicitly but it is necessary to extract from these two models the suitable choice of two different sets of variables. Several further necessary modifications for successful application of HMM are also described (determination of initial conditions, proper choice of solution time lengths on different scales, etc.).