O. Brüls, M. Arnold
The generalized-α scheme as a linear multistep integrator: Towards a general mechatronic simulator. - Journal of Computational and Nonlinear Dynamics, **3**(2008)041007.

Abstract. This paper presents a consistent formulation of the generalized-α time integration scheme for mechanical and mechatronic systems. The algorithm can deal with a non-constant mass matrix, controller dynamics, and kinematic constraints. The theoretical background relies on the analogy with linear multistep formulae, which leads to elegant results related with consistency, order conditions for constant and variable stepsize methods, as well as global convergence. Those results are illustrated for a controlled spring-mass system, and the method is also applied for the simulation of a vehicle semi-active suspension.

Contact: o.bruls@ulg.ac.be, martin.arnold@mathematik.uni-halle.de