M.A. Köbis, M. Arnold
Convergence of generalized-α time integration for nonlinear systems with stiff potential forces. In: Proceedings of The 2$^{\text{nd}}$ Joint International Conference on Multibody System Dynamics and The 7$^{\text{th}}$ Asian Conference on Multibody Dynamics, BEXCO, Busan, Korea, June 30 – July 3, 2014.

Abstract. We present a convergence analysis for generalized-α time integration methods applied to systems that are subject to stiff potential forces causing high frequency oscillations.
The analysis is based on the proof of convergence in the case of index-three differential-algebraic equations (DAEs) because in the limit of infinite stiffness, the analytic solution of the system approaches that of the associated DAE system.
The theoretical results are verified by numerical tests for a simple test example.

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