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Convergence analysis of generalized- α Lie group integrators for constrained systems. In J.C. Samin, P. Fiset (eds.): Proc. of Multibody Dynamics 2011 (ECCOMAS Thematic Conference). - Brussels, Belgium, 4 – 7 July 2011.

Abstract. The generalized- α method is a Newmark type integrator from structural dynamics that exploits the second order structure of the equations of motion. In the last few years, generalized- α methods have found increasing interest in multibody dynamics. The methods have been extended to mixed first order / second order systems of differential equations, to constrained systems and to second order differential-algebraic equations on Lie groups. In the present paper, we focus on the convergence analysis of the Lie group integrator. Furthermore, classical index reduction techniques from DAE numerics are used to reduce the influence of small constraint residuals on the numerical solution.

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