Jukka Tuomela, Teijo Arponen, Villesamuli Normi: *On the simulation of multibody systems with holonomic constraints*; Helsinki University of Technology, Institute of Mathematics, Research Reports A509 (2006).

Abstract: *We use Lagrangian formalism and jet spaces to derive a computational model to simulate multibody dynamics with holonomic constraints. Our approach avoids the traditional problems of drift-off and spurious oscillations. Hence even long simulations remain physically relevant. We illustrate our method with several numerical examples.*

AMS subject classifications: primary 65L80, 70E55 secondary 34A26, 65L05

Keywords: differential algebraic equations, multibody systems, Runge-Kutta methods, lagrangian mechanics

Correspondence

Jukka.Tuomela@joensuu.fi, Teijo.Arponen@hut.fi, Villesamuli.Normi@joensuu.fi

ISBN-13 978-951-22-8402-3 (printed)
ISBN-10 951-22-8402-2 (printed)
ISBN-13 978-951-22-8403-0 (elektronic)
ISBN-10 951-22-8403-0 (elektronic)
ISSN 0784-3143

Helsinki University of Technology
Department of Engineering Physics and Mathematics
Institute of Mathematics
P.O. Box 1100, 02015 HUT, Finland
email:math@hut.fi http://www.math.hut.fi/