

Tracking Control of Multiconstraint Nonsmooth Lagrangian Systems

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In this study one considers the tracking control problem of a class of nonsmooth fully actuated Lagrangian systems subject to frictionless unilateral constraints. The task under consideration consists of a succession of free and constrained phases. The transition from a constrained to a free phase is monitored via a Linear Complementarity Problem (LCP). On the other hand during the transition from a free to a constrained phase the dynamics contains some impacts that hamper the asymptotic stability. Nevertheless we have proved the practical weak stability of the system with an almost decreasing Lyapunov function. One numerical example illustrates the methodology described in the paper.