

Set Based Constant Reference Tracking for Continuous-Time Constrained Systems

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Abstract: In the paper study the possibility of tracking constant reference signals for a linear time-invariant dynamic system in the presence of state constraints. Resort to the theory of invariant sets due to its good capability of handling this kind of problem. Attention is placed on the determination of suitable sets for the attainable steady state values and of suitable control laws which guarantee that every possible output steady state value belonging to this set can be reached from any initial state belonging to a proper set. Then, based on recent results on the possibility of associating to these sets explicit smooth control laws, an explicit controller is derived which allows the system to asymptotically track constant reference signals and guarantees that no constraints violation occurs. Finally, an example of the implementation of the proposed control law will be reported.

Keywords: *Asymptotic stability domains; Lyapunov method; Lyapunov functions; non-linear systems; sets; uniform asymptotic stability.*

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