

On Adaptive VSS Control

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Abstract

In the conventional adaptive control field, parameter tuning law based on σ modification has been widely used to construct an adaptive controller. However, using the σ modification parameter tuning law, usually only the UUB stability can be attained for the adaptive control system. In this study, we simplify the parameter tuning law and the adaptive VSS control law to construct the proposed adaptive VSS control systems for typical firstorder systems. Even though the σ modification term in the parameter tuning law and the stabilizing control term in the adaptive control law are omitted, we shall show that asymptotical stability of the state and boundedness of the parameter estimates can be guaranteed. Particularly, in the proposed adaptive control schemes, only the structural information of the plant is needed. Several simulation examples are given to verify the proposed adaptive control algorithms.

Keyword : Adaptive VSS control