

Cross Coupling Sliding Mode Synchronization Control of Dual-Driving Feed System

Authors : Hong Lu, Wei Fan, Yongquan Zhang, Junbo Zhang

Abstract : A cross coupling sliding synchronization control strategy is proposed for the dual-driving feed system. This technology will minimize the position error oscillation and achieve the precise synchronization performance in the high speed and high precision drive system, especially some high speed and high precision machine. Moreover, a cross coupling compensation matrix is provided to offset the mismatched disturbance and the disturbance observer is established to eliminate the chattering phenomenon. Performance comparisons of proposed dual-driving cross coupling sliding mode control (CCSMC), normal cross coupling control [CCC] strategy with PID control, and electronic virtual main shaft control (EVMSC) strategy with SMC control are investigated by simulation and a dual-driving control system; the results show the effectiveness of the proposed control scheme.

Keywords : cross coupling matrix, dual motors, synchronization control, sliding mode control

Conference Title : ICME 2016 : International Conference on Mechanical Engineering

Conference Location : Boston, United States

Conference Dates : April 25-26, 2016