高速覆带车辆静液传动模糊自适应PID同步控制 Speed Synchronization Control of Hydrostatic Transmission Based on Fuzzy Self-tuning PID

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关键词： 履带车辆 静液传动 模糊自适应PID控制 同步控制

摘 要： 以某轻型高速履带车辆的静液传动系统为研究对象，结合模糊控制与PID控制方法，设计了模糊自适应PID同步控制器，仿真及试验表明：直驶工况下，采用该控制器的双泵双马达静液传动系统在经受突变载荷干扰时能有效抑制两侧马达转速误差值，快速同步到设定速度，具有较好的鲁棒性，所设计的控制系统优于常规的PID控制方法，适用于轻型高速履带车辆静液传动系统的同步控制。 Based on fuzzy control and PID control, a new type of fuzzy self-tuning PID controller was designed. The controller worked for synchronization control of hydrostatic transmission with dual pump and dual motor, which was used to drive a high speed light duty tracked vehicle. The results of simulation and tests showed that during straight running, the controller could restrain the motor speed error effectively when suffering different load disturbances, meanwhile it could get good synchronization results and the synchronization control was quite robust. The new control system is better than common PID control and is suitable for high speed tracked vehicle hydrostatic transmission.

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