Study and Development of Four-wheel-steering for Vehicle with Steer-by-wire System

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ABSTRACT

The main purpose of this study is to focus on the handing control of vehicle with Steer-by-Wire System (SBW). Vehicle with steer-by-wire system are get rid of limitations of traditional steering system, which can be developed the vehicle handing control. In vehicle handing control, the main purpose is to focus on sideslip angles at C.G. control. Under this control system, the vehicle would always have the minimal sideslip angle in C.G. range, and the vehicle would have stable handing at high speed or low speed in cornering. There are two methods for vehicle handing control. First, it is the front wheel control. Because there are only two tires in the front wheel steering system vehicle, we can not efficiently reduce the sideslip angle at C.G.. Therefor, we designed the new designs vehicle handing control of four wheels which can control the rear wheel. It will make vehicle more stabilize. First, we used the CarSim software to verify the proposed method for the vehicle handing control. Next, used of the LabVIEW is connected to the steer-by-wire system platform and the controller of steering motor to reach the second control interface . Then we cogitation the Steer-by-Wire system (SBW) with the backup system, and used the brake to simulate the second backup system.can verify that the vehicle can obtained a stable steering as vehicle is failure. Finally, we discuss the formal about the vehicle dynamic to apply the experimentation accuracy.

Keywords : Vehicle handing control ; Sideslip angle ; Steer-by-Wire System ; CarSim ; LabVIEW ; Backup system

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