汽车稳定性控制系统侧偏角道路试验测试系统 Sideslip Angle Roadway Test System for Vehicle Stability Control

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关键词： 汽车 稳定性控制系统 侧偏角 测试系统

摘 要： 汽车侧偏角是汽车动力学稳定性控制系统实现对汽车稳定性预估的主要依据，设计了“1+2”GPS侧偏角测试方案，即1个基准站和2个移动站，并搭建了道路试验系统。阐述了传感器选型、系统配置和侧偏角计算方法，进行了系统的实车道路试验，并基于光学侧偏角传感器同时测量的数据验证了GPS方案的可行性。汽车侧偏角道路试验系统能够实现高频率的精确定位、测速和侧偏角测量，兼顾车身和车轮位置姿态测量，现场安装快捷方便，可为稳定性控制系统开发中的侧偏角算法和控制逻辑验证提供试验依据。 Vehicle sideslip angle is employed by the vehicle stability control system (VSC) as the basis for predicting the vehicle maneuverability and stability. The scheme of sideslip angle test system based on the ‘1+2’ GPS technology, i.e. one base station and two roving stations, was proposed, and the corresponding system was developed. The paper firstly introduced the primary sensor matching and the devices installation, then described the computation method for the sideslip angle based on the GPS data. Finally, the systematical road way tests were conducted, and the effectiveness of GPS scheme was verified by the same group test data of sideslip angle obtained from the double-direction optical speed sensor. The sideslip angle test system was characterized of high frequency and accuracy for positioning, velocity and sideslip angle measurement for vehicle body and road wheels, and of convenient installation on the spot. It can provide the credible test ways for the verification of the sideslip angle estimation algorithm and the control logic of VSC.

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