

汽车外形对智能车辆队列行驶气动特性的影响

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摘要 为了研究智能交通系统中不同外形车辆在队列行驶时的空气动力特性, 以及车辆纵向间距对队列行驶车辆气动特性的影响, 采用数值模拟方法对阶背式、快背式和直背式轿车5车队列分别在6种纵向间距下的气动特性进行了研究。结果表明: 三种车型队列的平均减阻率大约为10%~40%, 节省燃油5%~20%。阶背式轿车队列的平均减阻率最大, 直背式次之, 快背式最小。随着纵向间距的减小, 每辆车的升力都增大, 稳定性都变差。

关键词 [车辆工程](#) [汽车空气动力学](#) [数值模拟](#) [队列行驶](#) [汽车外形](#)

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Influence of vehicle shape on the aerodynamic characteristics of intelligent vehicle platoon

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Abstract To study the aerodynamic characteristics of the platoon of vehicle with different shapes in the intelligent transport system and the influence of the longitudinal spacing between the vehicles on the aerodynamic characteristics of the vehicle platoon, the numerical simulation method was adopted to research the aerodynamic characteristics of the 5 car platoon with the notchback, fastback and squareback cars in 6 longitudinal spacings to provide a theoretical foundation for intelligent control of the vehicle shape and spacing in the platoon. The research results indicate that the average ratios of the drag reduction for the platoons composed of all three kinds of vehicle shape were in the range of 10%~40%, indicating that the platoon driving can save the fuel consumption obviously and decrease the exhaust emissions. The drag reduction of the notchback car platoon is the most, that of the squareback is the next, and the fastback is the least. With the decrease of the longitudinal spacing, the lift of vehicles increases, and their stability worsens.

Key words [vehicle engineering](#) [automotive aerodynamics](#) [numerical simulation](#) [platoon driving](#) [vehicle shape](#)

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