

Influence of rainfall and waterlogging on drivers' behavior – a driving simulator study

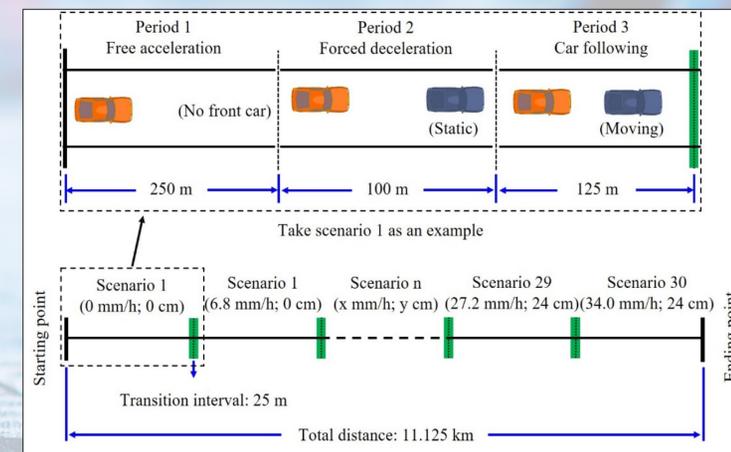
Background



Heavy rainstorms and waterlogging slow down the vehicles, cause traffic congestion, seriously affect the daily life of citizens and sometimes threaten people's lives.

To figure out the traffic characteristics in heavy rainstorm, coupling with waterlogging is a very important fundamental scientific problem.

Experiment



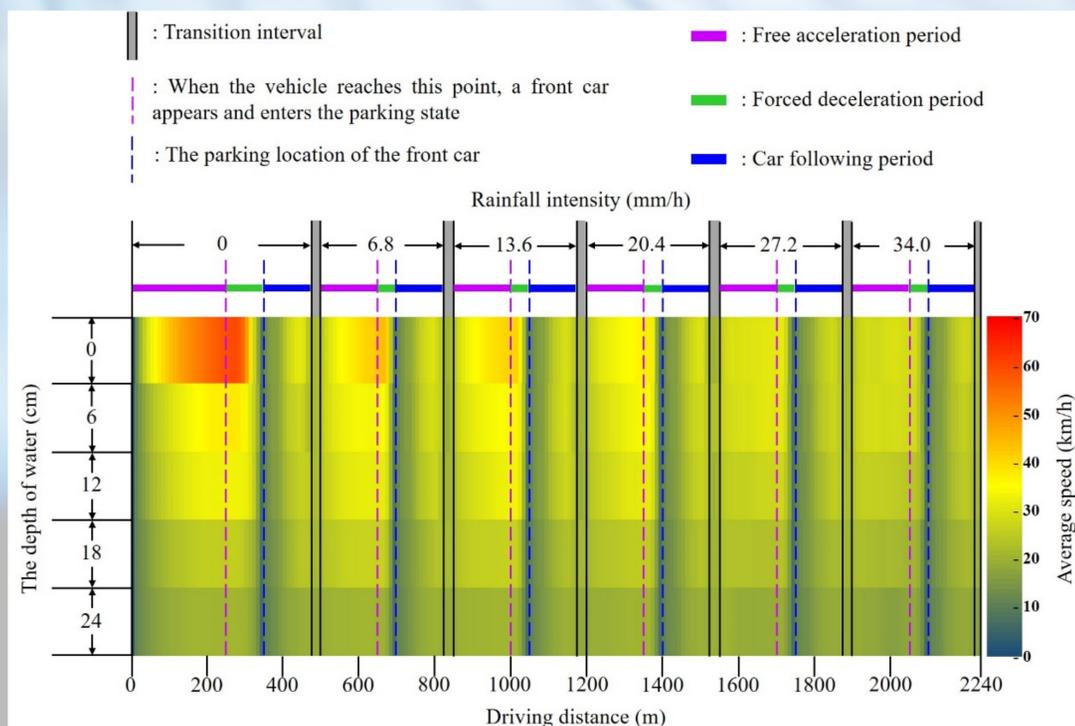
30 Scenarios
rainfall intensity: 6 × depth of water: 5



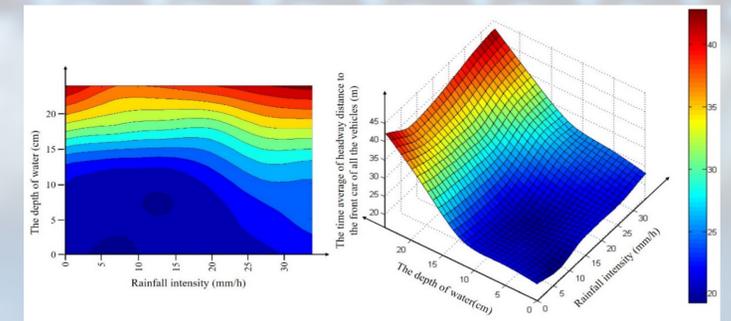
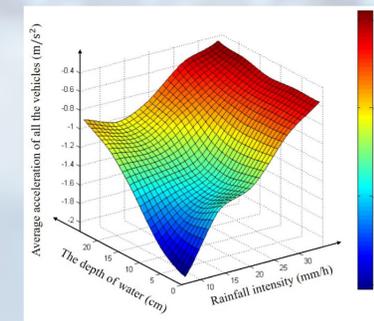
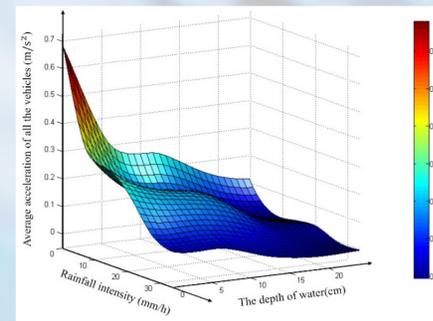
Overall scenario design

Driving simulator

Results



Average speed



3-D fitting curves

The results show that rainfall, waterlogging, and their interaction effect significantly influence drivers' acceleration/deceleration behavior in free acceleration period and forced deceleration period. Rainfall and waterlogging also significantly influence the headway distance when drivers are in the car following period.