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Study on information about road surface and vehicle behavior provided by steering-by-wire

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This study is a report of the results of a new information study and experiment with steer-by-wire to replace the steering feed back in conventional steering systems.

We devised hazard prediction information and warning information as two new information of steer-by-wire.

They were examined with reference to the background and technological trends of steer-by-wire issues, as well as the driver's reaction to the driver's driving process and information type of conventional steering system.

Hazard prediction information provides visual information to the driver based on the degree of danger calculated from the amount of behavior correction control.

Warning information provides the driver with auditory information based on the difference between the normative yaw rate and the actual yaw rate.

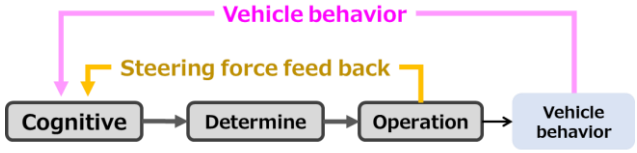

Fig.1 Driver driving process in conventional steering systems

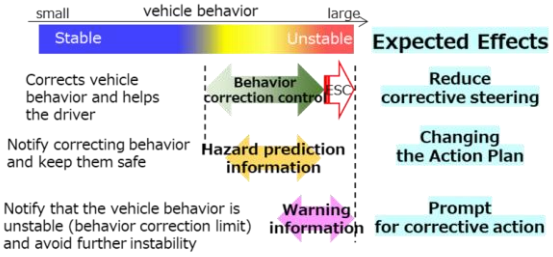

Fig.2 Information concept of steer-by-wire

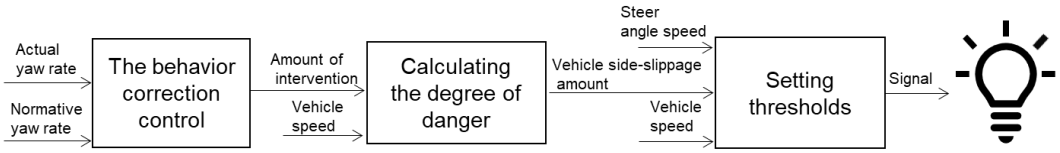

Fig.3 Hazard prediction information system

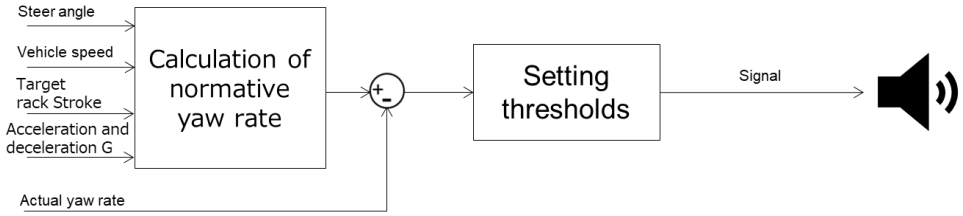

Fig.4 Warning Information System

The new information in this study found that by informing the driver of the unstable state of vehicle behavior accompanying the road surface and vehicle condition, it can affect the driver's action plan and correction operation.

In addition, it was confirmed that it is possible to approach a stable vehicle state and avoid an unstable vehicle condition.

In the future, we will verify it with more drivers and scenes to confirm the certainty of the effect.