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# **Consideration on the Behaviors of Automobiles During Collision in the Horizontal Plane Using the Dynamical Model**

Masaaki MORISAWA (森 沢 正 旭)

It is very necessary for the secure of the safety for the occupants in the automobile in collision to establish the method for quessing the behavior of automobiles during collision.

In this dissertation, for this purpose, the automobile was placed into the dynamical model in the horizontal plane, which consisted of the mass, the spring and the dash-pot. The method to search for the model constants was explained, too.

In the first chapter, the conventional methodes treating this problem and the main point of this dissertation were explained.

In the second chapter, the equations of motion of automobiles during the general collision was searched for, in consideration of the characteristics of tires and the relative friction of bodies at the contact portion as well as the deformation of bodies.

In the third chapter, the behavior of automobiles in the head-on collision or in collision from behind was theoretically analysed.

In the fourth chapter, the behavior of automobiles when the one clashed at right angles into the side of the other still was theoretically analysed.

In the fifth chapter, the behavior of automobiles when the one collided into the side of the other running in right angles was guessed. Secondly, the behavior of automobiles to collide at the voluntary angle after runnig each other, was guessed.

The sixth chapter is the conclusion of this dissertation. In the theory of this dissertation, the steering angle was fixed straight, and the effect of rolling and pitching was not considered, but the analysis using this model could well guess the behavior of automobiles during the various kinds of collision at the result of applying to the experiments using practical automobiles. Simultaneously it was concluded that the behavior of automobiles during collision could be theoretically guessed by this model without lots of experiments using practical automobiles.