

## Summary

Vehicle safety is gaining an always more significant role for the marketing of a new vehicle. Consumer tests serve to reproduce realistic accident scenarios. A majority of the accidents bearing a high risk of injury and fatal consequences result from car to car crashes. Particularly, collisions with a small lateral offset ( $<1/3$ ) lead to high deformations of the passenger survival space and high accelerations effecting the occupants [6].

In these cases, high intrusions are due to a lack of the activation of energy absorbing parts (longitudinal beam,...) and the wheels get stuck. This can result in a collapse of the passenger compartment, particularly, within the footroom of the driver. Such a scenario is not taken into consideration during standard car development.

By forming a sliding plane between the vehicles the intrusions and the loads on the occupants can be considerably reduced. Particularly, the velocities changes in driving direction are reduced to a minimum, due to the cars sliding along each other.

Solutions to this problem published to date can hardly be integrated into a serial production car. "Active Safety" solutions do exist, but cannot be implemented due to the legal situation and the necessary safety function of pre-crash sensor.

The problem can be solved by integrating a mechanical system within the bumper, which is activated by crash-energy (passive system). The requirements of the consumer tests (particularly pedestrian protection and bumper test) are to be kept.

Within the scope of a Kplus - research project the competence center "The virtual vehicle" works on the development of such systems in co-operation with MAGNA Steyr Fahrzeugtechnik and the Technical University of Graz.