RESULTS OF PhD THESIS ABSTRACT

# ” DYNAMICS OF ROAD VEHICLES INVOLVED IN ROAD ACCIDENTS”

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Establishing the dynamics of vehicles involved in road accidents is a requirement imposed on technical experts by the judiciary. Today there are mathematical models and specialized programs that allow including vehicle dynamics involved in road accident. However, it’s have a major disadvantage: there are not taken into account active safety control systems. Consequently, the paper aims to eliminate this disadvantage so the main purpose is to study the dynamics of vehicles equipped with electronic control systems which are specific to active safety systems.

Chapter 1 is entitled *The current state of the concerned issue*. A summary is presented that highlights the main features of current approaches to the dynamics of vehicles involved in road accidents. Also, the objectives of the PhD thesis are presented.

Chapter 2 is entitled *Road Safety Indicators*. There are presented some computation relationships and the values of some safety indicators used in the specialty literature, as well as the establishment of the collision risk is presented. The computation relations are presented and some of the mathematical models of traffic movement used in the specialty literature are applied.

Chapter 3 is entitled *Dynamics of vehicles equipped with stability control systems*. Is analyzed the anti-lock braking system of vehicles equipped with such systems. The analysis of the traction control system is performed and the dynamics of the vehicles equipped with such a system is presented. The analysis of the electronic stability control system with the lateral dynamics and the yaw movement is performed.

Chapter 4 is entitled *Dynamics of vehicles equipped with roll motion control systems*. There are established and presented resistances assessments indices to overturning. The modeling of the ARC roller motion control system is shown and the dynamics of the vehicles involved in a real road accident are presented where also the rollover occurred.

Chapter 5 is entitled *Dynamics of vehicles equipped with cruise control systems*. It approaches the control of the longitudinal dynamics of the vehicle, as well as its dynamics when the vehicle is equipped with an adaptive cruise control system.

Chapter 6 is entitled *Dynamics of vehicles equipped with collision avoidance systems*. Are analyzed the types of collision avoidance systems which equip current vehicles. Autonomous emergency braking system is also approached. Dynamic study of vehicles involved in real road accident from exploitation is carried out by using the PC-Crash software and the possibility of avoidance of the accident by bypass using the collision avoidance system is taken in account.

Chapter 7 is entitled *Dynamics of vehicles equipped with lane change control system*. The lane keeping assistance system is approached. The dynamics of the vehicle at the double lane change is presented according to ISO 3888-2. Also the dynamics of the vehicles in case of two real accidents from operation is presented, with the showing of the possibility to avoid them by changing the lane.

Chapter 8 is entitled *Dynamics of vehicles equipped with post-impact displacement control systems*. The currently used post-impact displacement control systems are analyzed. It presents the dynamics of vehicles involved in a real accident from exploitation and the study of the possibility of avoiding it if the post-impact control system is active.

Chapter 9 is entitled *Contributions, openings of the paper and dissemination of research results*. The contributions made in the study of the dynamics of vehicles involved in road accidents are presented. Some openings are highlighted from the PhD thesis. The dissemination of the research results, as well as the list of published works are presented.