

**F2010-E-069**

## **DESIGN OF A RECONFIGURABLE GLOBAL CHASSIS CONTROL**

<sup>1</sup>Gáspár, Péter, <sup>1</sup>Szabó, Zoltán, <sup>1</sup>Bokor, József, <sup>2</sup>Sename, Olivier, <sup>2</sup>Dugard, Luc

<sup>1</sup>Systems and Control Laboratory, Computer and Automation Research Institute, Hungary

<sup>2</sup>GIPSA-lab, Department of Control Systems, Grenoble INP, France

**KEYWORDS** – robust control, reconfigurable, fault-tolerant, LPV methods, integrated control

**ABSTRACT** - The paper proposes an integration control which consists of an active steering, active suspension and an active brake system. The integrated control is proposed for tracking the path of the vehicle, guaranteeing road holding and improving pitch and roll stability. In cruising mode, the steering minimizes the tracking error while the suspension system is operating. When the monitoring signals have reached their critical values, the brake is also activated in order to improve roll and pitch stability. In extreme situations, such as an imminent rollover, the safety requirement overwrites the passenger comfort demand by executing a functional reconfiguration of the control goals by generating a stabilizing moment to balance an overturning moment. This reconfiguration is achieved by a sufficient balance between the performance requirements imposed on the suspension system. It is shown that the performance specifications can be formalized in terms of parameter-dependent weightings while the LPV method guarantees that the integrated control meets the defined performance specifications.