Hybrid System focused in Energy Management Applications with Non-negligible Dissipation in Autonomous Electric Vehicles.

ABSTRACT. Efficient regulation of the energy transfer in autonomous electrical vehicles with storage and load subsystems is a topic of current practical interest. A new strategy to achieve this objective, together with its corresponding power electronics implementation, was recently proposed. The recent device is called dynamic energy follower (DEF) because, in contrast with current practice, the regulation of the direction and rate of change of the power flow is done without relying on steady-state considerations. A key assumption for the correct operation of the DEF is that dissipation in the system is negligible. In this work a DEF that takes into account the presence of losses is proposed. Simulation and experimental evidence of the performance improvement with the DEF are presented in autonomous vehicles application.