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### Realistic energy management strategy on parallel hybrid electric vehicles

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**F**or the realistic energy management of hybrid powertrains an approach which provides efficient management of state of charge (SOC) and improvement of drivability by utilizing an adaptive torque control and an instantaneous minimization method known as equivalent consumption minimization strategy (ECMS) is presented. The main idea is to control the electric motor torque through SOC-based gain adaptation so as to obtain effective energy management within the prescribed SOC window while securing drivability by suppressing a sense of incompatibility caused by the power sources. To the best of authors' knowledge, this is the first result on the ECMS synthesis considering the improvement of drivability through direct torque control from a perspective of realistic implementation. To directly adapt the power sources which are a representative cause for interior noise, the adaptive torque control input is designed outside the ECMS framework. Within the prescribed SOC window an adaptive torque distribution makes the energy management effective while directly adjusting the source strength for improving interior noise, vibration and harshness (NVH). The proposed strategy has been applied to the prototype of Sonata Hybrid of Hyundai Motor Company (HMC) to practically assess driving performance. Test results show the performance about the SOC management and the noise attenuation comparing to adaptive ECMS methods.

#### Biography

Dohee Kim has received his PhD Degree in 2011 from the Department of Mechanical and Aerospace Engineering, University of Florida. He has published more than 20 papers for nonlinear controls and applications in reputed journals and conferences.

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