

Disertante/ Speaker:

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Título/ title:

The Powertrain Evolution for Automotive Applications.



Resumen/Abstract:

Environmentally minded automotive technologies are expected to shift from conventional gasoline and Diesel engines and evolve toward electric powertrain systems using electric motors and inverters, such as Hybrid Electric Vehicles (HEVs), Plug-in Hybrid Electric Vehicles (PHEVs) and Electric Vehicles (EVs). The first part of this talk will be focused on the difficulties that conventional internal combustion engine, especially Diesel engine, will have to comply with the upcoming pollution regulations. For Diesel engines to comply the limits of soot and NOx an increase of at least 20% of the engine cost was assessed, this consideration put this kind of engine, for light duty vehicles, out of the European and US market. Taking in account that, in the last years about 50% of the new vehicles are equipped whit DI Diesel engines is simply to understood the industrial impact of these considerations. In the second part of the talk will be introduced a possible evolution of the powertrain system that starts from the "Mild Hybrid", recently introduce by AUDI. The mild-hybrid technology is becoming increasingly popular among car manufacturers. A sort of "light" hybrid that ensures greater efficiency to the endothermic component of the system. Therefore lower consumption and consequently reduced harmful emissions. The second step is the hybrid powertrain, this technology was been introduced by TOYOTA with a parallel configuration. In this configuration the IC engine and the motor/generator are connected to the same shaft that drives the wheels through a transmission. During braking and downhills, the wheels can drive the generator to charge the battery pack. Also the IC engine can be throttled up to drive the generator and charge the battery pack during light loads. In this situation the generator acts as a brake on the engine in order to keep the wheels at the desired speed. For this type of powertrain the energy management play a significant role to archived a significant reduction of fuel consumption and CO2 emission. Finally the EVs, they reached the target of zero emissions vehicle, will be analyzed highlighting the limits due to the limitations of energy storage of the batteries and the new problems that arise from the absence of the thermal engine, such as the management of the air conditioning system. The simulation analysis is an important tool for the optimization of the energy fluxes, in all types the vehicle. Same examples will be illustrated with the relative numerical tools.

Bio Conferencista/ Bio Lecturer: