

Can regenerative braking improve energy recovery in diesel-electric freight trains?

The present work evaluates the application of regenerative braking for energy recovery in diesel-electric freight trains to increase efficiency and to improve decarbonization. The energy from regenerative braking has to be stored onboard when the track is not electrified. Different technologies of energy recovery are presented and discussed.

Can a dual-mode locomotive increase energy recovery during braking?

The global energy reduction is around 1.1% compared with the second EMS and 12.8% without energy recovering. These results show a real opportunity to increase the energy recovered during braking. A dual-mode locomotive has a common drivetrain that operates on not- and electrified tracks.

Can a dual-mode hybrid locomotive manage energy consumption?

This study proposes an energy management strategy (EMS) for a dual-mode hybrid locomotive equipped with a fuel cell, supercapacitors, and batteries, and intermittent access to an electrified overhead catenary. It is inspired by the Ragone plot and does not consider information or predictions of future load consumption.

What is the braking energy dissipated on the on-board resistors?

The braking energy dissipated on the on-board resistors is constantly 0% since no voltage limiter is included in this first analysis. Fig. 24 shows the voltage peak due to regenerative braking, as a function of the braking request and of the position between two adjacent Electrical Sub-Stations where the train begins the braking manoeuvre.

Are fuel cell locomotives a good alternative to diesel engines?

Considering the high cost of the network electrification, this is a good compromise to reduce energy consumption in rail transport [1]. In this regard, fuel cell (FC) locomotives are considered as a great alternative to moving away from locomotives using diesel engines [2 - 8].

Is Bellman-Ford algorithm feasible for electric traction motors?

It is feasible for locomotives with electric traction motors, both electric and diesel-electric. With the purpose of maximizing the regenerated energy, the Bellman-Ford algorithm has been used in [8] to optimize the braking and speed of a train.

possibility of storage of energy generation of electrical units in braking zones. It is necessary to take into account that diesel-electric locomotives need the full power of diesel engine in a ...

Any available brake energy would be first applied to charging the flywheel. It possible, some flywheel charging may be performed with diesel energy if this allows a diesel to operate under ...

homes to vital but inelegant systems like friction brakes on nearly every mode of transportation. The theory of regenerative braking captures the energy expended when cars use their brakes ...

(b) Loaded locomotive run Figure1 Energy distribution during locomotive run Table 1 Summary of energy distribution Table 1 summarizes the energy use for the two duty cycles analyzed. The ...

As fuel costs and environmental impacts assume greater importance to railways, so does the importance of options for increased energy efficiency and emissions reduction. A study was ...

on the all speed. Air brake cannot be used. When a vehicle brakes, energy is released to date, most of this energy is being wasted in air. Th e challenging alternative is to store the braking ...

Hybrid electric propulsion, using batteries for energy storage, is making significant inroads into railway transportation because of its potential for notable fuel savings and the related reductions in greenhouse gases ...

The goal of this research is to explore the possible benefits of utilisation of locomotive for mid-term energy storage. Various technologies are available in the market, including the Flywheel ...

The analysis of energy recovering and storage in locomotives consists of an open and promising topic for research, particularly concerning the more suitable alternatives for a given type of system and

In addition, the research trends of regenerative braking energy utilization technology in urban rail transit were analyzed, and future research can focus on system topology optimization, energy...

Literature survey allows the understanding of the locomotive, energy storage systems and basic power control systems. It also allows selection of appropriate energy storage mediums for on ...

**Belmopan locomotive energy storage
brake**