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Title: Temperature and Current Density Analysis of Thermoelectric Generator for Regenerative Breaking of the Hybrid Electric Vehicle

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Abstract:

The advancement in the area of Hybrid Electric Vehicles (HEVs) is one of the most dynamic in the modern world with the concern of global warming issues. The incorporation of a Regenerative Braking System (RBS) into this technology is also a primary element in keeping this field up to date fiercely. It is shown in this article that the suggested Thermo-Electric Generator (TEG) model can be compared to other current RBS technologies using the comparative research method described above. Aside from that, a representation of the model is provided together with the results of the temperature and current density study performed using the TEG. The suggested design was simulated using the Ansys mechanical model and the Ansys 2021 Workbench software, which was used to generate a test simulation of the concept. This device captures the wasted heat of the vehicle energy from the brake pad of the wheels and turns it into useful electrical energy. In accordance with the principles of RBS, this design will be one of the most important sources of extending the driving range of HEVs while simultaneously reducing the net cost of recharging for the end-user.