

Characterization of a battery test bench for the Nissan Leaf

Supervisors: R. German, A. Bouscayrol

Contact: ronan.german@univ-lille.fr

Context

As part of the CUMIN program (University Campus with Innovative and Carbon Neutral Mobility), the L2EP studies the energy consumption of electric vehicles [Desrevaux 2020] and the behavior of their batteries [German 2019].

The L2EP has acquired the Nissan LEAF, which has a 40 kWh NMC Li-ion battery, in order to study the home trips of users of the Cit  Scientifique campus. In this context, a battery bench of the same category but of reduced capacity has been designed and built to be integrated into the HIL benches of the L2EP [Fadili 2022].



Objective

The objective is to characterize the battery bench developed in 2022 at the L2EP. This bench will be subjected to a characterization cycle via a controllable power source. From the experimental measurements, an automated treatment will make it possible to identify the parameters (electrical and thermal) of the bench. An experimental validation of the model is requested.

References

- [Fadili 2022] S. Fadili, R. German, A. Bouscayrol, " HiL Testing of a High C-Rate Battery For the Nissan Leaf," 2022 IEEE Vehicle Power and Propulsion Conference (VPPC), Merced, USA, 2022, pp. 1-6.
- [Desrevaux 2020] A. Desrevaux, A. Bouscayrol, E. Castex, R. Triguie, E. Hittinger, G..M. Sirbu, "Annual variation in energy consumption of an electric vehicle used for commuting ", *Energies*, vol 12, n 18, September 2020, pp 1-15, DOI: <https://doi.org/10.3390/en13184639>, (common paper of L2EP, TVES, LTE-ISFTTAR, Rochester Inst. Tech. (USA), Renault Technology Romania, within the MEGEVH network, the CUMIN programme and the PANDA H2020 project GA #824256).
- [German 2019] R. German, S. Shili, A. Desrevaux, A. Sari, P. Venet and A. Bouscayrol, "Dynamical Coupling of a Battery Electro-Thermal Model and the Traction Model of an EV for Driving Range Simulation", *IEEE transactions on Vehicular Technology*, Vo. 69, no. 1, January 2020, pp. 328-337, Print ISSN: 0018-9545, Online ISSN: 1939-9359, DOI: 10.1109/TVT.2019.2955856 (common paper of L2EP, and AMPERE, within the MEGEVH network).