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Abstract

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Abstract:

Ultracapacitors are traditionally employed as secondary power plants in hybrid electric systems to relieve the primary plant from peak loading. This paper focuses, however, on a new paradigm: the ultracapacitor as the sole power plant in an electric system. Circumventing the cost and complexity of traditional power plant options, an architecture and design method is introduced and applied to a candidate application: the autonomous, electric rail-guided vehicle operating in a clean room manufacturing environment. Simulation and experimental data show the success of this approach with respect to desired system performance (energy storage, peak loading, power delivery, and charging time).

Published in: Nineteenth Annual IEEE Applied Power Electronics Conference and Exposition, 2004. APEC '04.