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Fast Charging of High Energy Li-ion Battery with Integrated Passive Thermal Management

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ABSTRACT:

With emerging trends in transportation electrification, fast charging of high energy Li-ion battery can help to break through the bottleneck of its widespread adoption. Rapid charging 50% of battery capacity within 10-15 minutes, commonly referred to as 'filling the tank' experience, could dramatically reduce the vehicle down time as well as the overall battery pack size, especially for fleet vehicles. To date, such fast-charging capability has been limited to high power batteries over narrow a window of operating conditions to avoid premature aging of the battery (mainly due to lithium plating) and safety concerns,

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Said Al-Hallaj is the Chief Battery Scientist of Beam Global company (Nasdaq: BEEM, BEEMW), Co-founder and CEO of AllCell Technologies LLC (recently acquired by Beam Global), Founder and CEO of NETenergy, a thermal energy storage company, and a Research Professor of Chemical Engineering at the University of Illinois at Chicago (UIC). Dr. Al-Hallaj earned his bachelor and master's degrees in chemical engineering from Jordan University of Science and Technology (JUST) and a Ph.D. in chemical engineering from the Illinois Institute of Technology (IIT). Said co-authored a book entitled "Hybrid Hydrogen Systems" and has published several book chapters and numerous numbers of peer reviewed and conference journal papers with >10,000 literature citations. Said is a serial entrepreneur, and his R&D effort has led to the successful commercialization of several clean-tech technologies.