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Ph.D. Seminar Talk 1

Title: **Thermal Management of Cylindrical Lithium-Ion Battery at High C-rates Using an Innovative Hybrid Tab Cooling Strategy**

Speaker: **Mr. Dinesh Reddy Koppula (ME18D019)**

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Date and Time: **07-04-2026 @ 3:00 PM**

Venue: <https://meet.google.com/ozw-qdwa-emv>

Abstract

This study proposes and investigates the thermal performance of a hybrid tab-cooled heat sink for cylindrical lithium-ion cells under three conditions—constant high-rate discharges from 3 C to 6.67 C, a dynamic Federal Urban Driving Schedule (FUDS) profile, and scaling from a single 4.5 Ah 21700 lithium-ion(li-ion) cell to a 2s-2 p battery pack with four 18650 li-ion cells. Compared with a plane-tab reference fixture, the hybrid sink reduced the single-cell peak temperature by 18oC at 4 C and 35oC at 6.67 C. At higher C rates the temperature gradient is roughly halved. Under FUDS, the peak temperature dropped by 8oC. For the four-cell battery pack, the design lowered the maximum temperature by 10oC during a 3 C discharge and by 6oC in FUDS. These results show that direct tab extraction preserves safe temperature margins from single cells up to small modules, offering a straightforward path toward reliable, high-power battery packs