

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
New Materials and Structural Concepts (4)

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THE IMPACT OF STRUCTURAL BATTERY TECHNOLOGY ON FUTURE SPACE MISSIONS

Abstract

Volume-efficient electric energy storage technologies have rapidly advanced in recent years, largely motivated by the automotive industry's investment in electric power. A key development of note is that of 'structural batteries', such as those being investigated by BAE Systems for use in an electric racing car prototype. Structural batteries are a novel approach to energy storage, where the battery sits, in effect, within the structural components of a system. Current forms include those comprised of honeycomb carbon fibre composites. This technology is of notable interest to spacecraft however may have many implications on volume efficiency, configuration, thermal behaviour, harnessing, spacecraft charging and grounding, along with a series of other factors. This paper shall discuss the potential spin in use of 'structural batteries' on spacecraft platform designs along with the advantages and disadvantages of its use, with particular focus on the structural implications of its implementation. It shall further identify what improvements to the current technology would be necessary for useful implementation on space missions.