Structural Supercapacitors and Batteries

Lightweight energy storage is vital to environmentally friendly transport, including electrical vehicles, electrical drones, and wearable devices. Structures that can simultaneously carry load and store electrical energy while simultaneously providing an energy density equivalent to the current state-of-the-art supercapacitors are critical enablers for these new technologies.

More Information

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Competitive advantage

- The current bottleneck preventing the production of structural energy storage devices is the development of a stiff and strong material which also exhibits the high ionic conductivity needed to facilitate the electrochemical processes inherent in common energy storage devices such as batteries and supercapacitors.
- Development of structurally strong batteries and supercapacitors
- Ability to integrate energy storage into the load bearing capability of a transport structure, eliminating the need for a traditional energy storage device and its weight from the platform
- Significant weight savings in autonomous vehicles leading to improved energy efficiency for direct energy requirements, and embedded communications and sensing technologies enabling energy to serve other capabilities leading to greater capabilities

Impact

- Light weight energy storage devices for Defence applications where high energy storage density is required.

Successful applications

- The first generation of structural batteries has been demonstrated by embedding flexible lithium ion batteries into laminated fibre composites. The resulting structure can simultaneously store electricity and carry load.

Our partners

- Defence Science and Technology (DST)