Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

**$MnO_2$ Encapsulated Electrospun $TiO_2$ Nanofibers: A Strategic Approach towards the Development of Aqueous Electrolyte Based Asymmetric Supercapacitors** MUHAMED SHAREEF, Kansas State University, MILAN PALEI, TIRUPATTUR NATARAJAN SRINIVASAN, Indian Institute of Technology Madras, GURPREET SINGH, Kansas State University — An aqueous electrolyte based asymmetric supercapacitor was designed from $MnO_2$ coated $TiO_2$ nanofibers which were prepared by electrospinning and post hydrothermal process. The core shell fiber architecture exhibit highest specific capacitance of 868 F/g in aqueous $Na_2SO_4$ electrolyte as compared to the similar structures. The Asymmetric supercapacitor (ASC) fabricated based on these core shell fibers demonstrates large voltage window of 2.6 V which is one of the widest voltage window among aqueous electrolyte based asymmetric supercapacitors. In addition, the ASC delivers large specific capacitance and energy density as revealed by the electrochemical studies. The thin $MnO_2$ shell, of thickness 6 nm, contributes to the extraordinary electrochemical performance for charge storage by redox reaction and intercalation mechanisms, while the anatase phase $TiO_2$ core provides an easy pathway for electronic transport with additional electrochemical stability over thousands of charge discharge cycles.

Muhamed Shareef
Kansas State University

Date submitted: 06 Nov 2015 Electronic form version 1.4