Abstract

In recent years, power electronics as a field has been characterized by rapid growth in both applications and constituent technologies. New devices and materials, including wide bandgap semiconductors, combined with the growing popularity of soft-switching, quasi-resonant, resonant, multi-resonant, switched capacitor, and hybrid converter topologies, expand the scope of viable designs. Enhancement of the performance of state-of-the-art systems requires higher fidelity models to differentiate between vastly distinct circuit implementations. The presentation reviews some of the prior and ongoing power electronics research projects at the University of Tennessee, with a focus on opportunities and pathways to improve models and designs.

Biography

Daniel Costinett received B.S. and M.S. degrees in 2011, and a Ph.D. degree in 2013 from the University of Colorado Boulder. Since 2013, he has been an Assistant Professor in the Department of Electrical Engineering and Computer Science at the University of Tennessee, Knoxville (UTK). He was an instructor at Utah State University, in 2012. His research interests include resonant and soft switching power converter design, high-efficiency wired and wireless power supplies, on-chip power conversion, medical devices, and electric vehicles. Dr. Costinett is the Co-Director of Education and Diversity for the National Science Foundation/Department of Energy funded Research Center for Ultra-wide-area Resilient Electric Energy Transmission Networks (CURENT). He holds also a Joint Faculty position with the Power Electronics and Electric Machinery Research Center at the Oak Ridge National Laboratory. He serves as Associate Editor of the IEEE Journal of Emerging and Selected Topics in Power Electronics and the IEEE Transactions on Power Electronics.