On-chip Switched-capacitor DC-DC converters: Overview and Challenges.

Speaker:

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Abstract:

Power conversion is crucial to most electronic systems due to different voltage levels requirement within a system. Switched-capacitor converters are a subset of switching-mode converters, where the energy is transferred from the input to the output using only capacitors and switches. Switched-capacitor converters provide compact solution due to its magnetic-less structure, which makes them ideal to fulfill the high density requirement in low power applications.

In this seminar, a general overview about SCC will be presented. Then, we will discuss two main challenges of implementing on-chip SCC: converter synthesis and parasitic capacitor losses. Throughout the presentation, we will touch upon some important theories and analysis related to SCC.

Bio:

Dr. Yaqub Mahnashi received the B.Sc. and M.Sc. degrees in electrical engineering from King Fahd University of Petroleum and Minerals (KFUPM), Dhahran, Saudi Arabia, in 2008 and 2012, respectively, and the Ph.D. degree in electrical engineering from Michigan State University (MSU), East Lansing, USA in 2018. During his study at MSU, he was with the Power Electronics and Motor Drives Laboratory. He is currently an Assistant Professor in the Department of Electrical Engineering, KFUPM. His research interests are switched-capacitor circuits, IC power converters, filter design and low power circuits for biomedical and energy harvesting applications.