ABSTRACT

For millimeter-wave and THz applications, planar integrated antennas are appealing because they avoid the parasitics and loss incurred with a millimeter-wave transition off-chip. In addition, the planar solutions are typically cheaper and less bulky than traditional waveguide systems. In this talk, I will focus on two types of planar millimeter-wave antennas developed at UCSD. First, the dual-polarized sinuous antenna on a silicon lens will be presented. The antenna exhibits stable impedance, beam symmetry, and polarization purity over a multi-octave bandwidth. It is useful for quasi-optical and imaging systems, and it is particularly suited to radio-astronomy applications. Next, I will discuss the design of on-chip antennas for CMOS RFICs. I will detail the unique challenges presented by the integrated circuit environment and provide a novel design approach. In comparison to solutions currently in the literature, our approach achieves high efficiency without modifying the chip or coupling to an off-chip radiator. As a result, this solution achieves low cost and ease of fabrication, and it is readily scaled to frequencies above 100 GHz.

BIOGRAPHY

Jennifer Edwards graduated from Pennsylvania State University with degrees in Electrical Engineering and Computer Engineering in 2004. She is currently pursuing a doctoral degree in Electrical Engineering at the University of California, San Diego under the supervision of Prof. Gabriel M. Rebeiz. From 2005 – 2007 she worked for SPAWAR Systems Center, San Diego, where she worked on electrically small antennas and frequency-selective surfaces. In 2011, she worked at Qualcomm, Inc., where she developed an aperture reuse diversity antenna for mobile electronics. Her research interests include on-chip antennas, electrically small antennas, and reconfigurable solutions for microwave and millimeter-wave systems.