

Abstract: Recently, surface plasmon polariton (SPP) modes have become the research focus of many works. The SPP modes have been observed in different nanostructures and showed appealing features including high field confinement and flexible configurations. Introduction of spoofed SPPs has enabled scaling down the plasmonic phenomena to different circuit operation frequency ranges. These developments has opened a promising vista for a new generation of high performance plasmonic circuits and highlighted the need for a systematic design method for different high efficient plasmonic circuit devices. In this talk, we will present the plasmonic circuit modeling technique to be applied for design of different circuit components. Various plasmonic transmission lines will be presented with extra merits including much lower ohmic loss and mutual coupling in comparison with conventional counterparts. Furthermore, the implementation of plasmonics structures in antenna designs will be covered. The plasmonic feeding network for dielectric resonator antennas will be presented. The feed is applied for excitation of the prohibited TE modes of DRA with their unique radiation patterns. The method enables the excitation of planar DRAs which are highly demanded for compact integrated circuits.