

Design considerations of various planar waveguiding structures for use as ESR line

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Abstract

In this talk, the microstrip line topology commonly used as an ESR line for spin manipulation is briefly reviewed first. While the fringing magnetic field of microstrip line is the key for ESR line application, the fringing magnetic and/or electric fields may also be detrimental to operations of nearby devices that are susceptible to external ac fields. Therefore, meticulous control of the fringing field distribution of ESR line might be essential to the implementation of multi-qubit systems. To this end, various planar waveguiding structures, including the conductor-backed coplanar waveguide (CBCPW) and the substrate integrated waveguide, will be introduced as an alternative and compared with each other. The feasibilities of these waveguiding structures as an ESR line will be discussed as well.