

D 2.2 Fabrication and operation of superconducting beam splitter for microwaves

We designed a hybrid directional coupler, which is the microwave equivalent of a beam splitter in optics. The design and its performance are shown in **Fig. 1**. The directional coupler is working according to the simulation except parameter S_{41} , which is higher. It was found that this discrepancy is caused by reflection of the signal from bonding wires connecting the silicon chip to the sample holder and it is not an intrinsic property of the directional coupler. The reflection will be minimized in a new design of the sample holder, which enables a shortening of the bond wires.

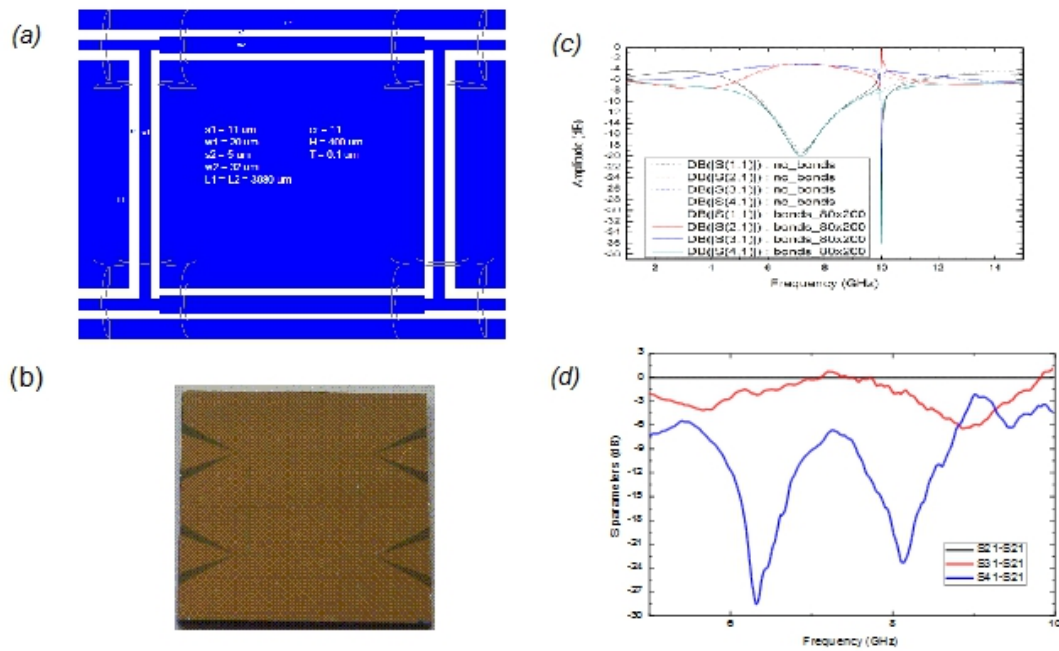


Fig. 1 directional coupler for 7.5 GHz. a) design, b) directional coupler fabricated by electron lithography, c) design simulations d) s-parameters obtained from experiments at 300 mK.