

PROGRESS IN SIS DEVICE FABRICATION FOR HIFI MIXER BAND 2 AT KOSMA

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We present our progress in device fabrication of Nb – Al₂O₃ – Nb junctions embedded into low loss tuning circuits. These integrated tuning circuits include a NbTiN ground plane and aluminum or niobium as top conductor materials. The junctions are defined by electron beam lithography down to areas of 0.4 μm². Instead of a liftoff process we use Chemical Mechanical Polishing (CMP) of the SiO₂ dielectric insulation to contact the junction top electrode.

Dipstick I/V measurements of devices with R_NA products between 12 – 15 ohm-μm² show a significantly higher gap voltage as compared to previously UV lithography / liftoff defined devices using otherwise identical fabrication parameters. The same devices show less gap voltage reduction when local oscillator power between 630 GHz – 800 GHz is applied.

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