accuracy, quality factor, stop band rejection, dynamic range, channel noise level.

Completed system level study with MATLAB and established a Mapping of these parameters to already established performance space Implementation of

Filter design challenges

Use Signal-to-Interferer-plus-Noise-Ratio (SINR) Improvement as a figure of merit:

Accurate setting of the rejection frequency (High Q

Tunable

A filtering scheme for attenuating interferer.

Common problem: detecting a small amplitude signal of interest (SOI) in presence of strong interfering signal at a nearby frequency.

Nonlinear investigation with Harmonic Balance in ADS

Mixed-mode S-parameter measurements with Pure-mode or multiport

Noise Figure

Differential and Common-mode Gain.

Delay

Phase

Filter

Controller

Advisor: Professor John McNeill

IN
OUT
SINR
SINR = TIMPROVEMENSINR

Figure 3.

Figure 2.

Figure 1.

System Level Modeling

Analysis and Implementation of an RF System with Real Time Autonomous and Intelligent Control

System level strategy

Wireless Environment

Focus on design and layout of wideband (1-3GHz) differential, low noise amplifier. Topologies considered:

Complete System Tests

Functionality Tests of the LNA

Nonlinearity, NF, S-parameters vs. LNA design parameters

Nonlinear behavior

Small signal S-parameters

Figure 7.

Figure 6.

Figure 5.

Figure 4.

Figure 10

Figure 12.

Figure 11.

Figure 15.

Figure 13.

Figure 16.

Figure 19.

Figure 18.

Figure 20.

Figure 22.

Figure 21.

Figure 14.

Figure 17.

Stability.

Common mode rejection ratio (CMRR)

Noise Characteristics

CMRR

process and schematics simulated in ADS

Altin Pelteku

BiCMOS

process

Mixed-model

Test Plans

IC system performance test setup.

Figure 24.

Figure 23.

Figure 22.

Figure 21.

Figure 20.

Figure 19.

Figure 18.

Figure 17.

Figure 16.

Figure 15.

Figure 14.

Figure 13.

Figure 12.

Figure 11.

Figure 10.

Figure 9.

Figure 8.

Figure 7.

Figure 6.

Figure 5.

Figure 4.

Figure 3.

Figure 2.

Figure 1.