

GPS9-1: Receiver Technology

MM7: October 12, 14.30, room NJV14 3-119

Purpose

The purpose of this lecture is to introduce signal and signal quality measures for RF receiver front-ends, as well as block/receiver figures-of-merit.

Subjects

This lecture will concentrate on mathematical descriptions of signals, noise and distortion in receiver front-ends.

- Description of signals
 - In-phase/Quadrature
 - Polar (Amplitude/phase)
 - Complex Envelope
- Noise
 - White noise/Band limited white noise - Mathematical description
 - Physical noise sources
- Distortion
 - Simple distortion model (power series)
 - Compression
 - Clipping
 - Intermodulation
- Receiver Figures-of-Merit
 - Gain (Voltage gain vs. Power Gain)
 - Sensitivity
 - Compression point/Intercept points
 - Dynamic Range

There will be a lecture of 2×45 minutes, followed by two hours of problem solving.

Literature

- Lecture note by Torben Larsen (pdf).
- Viewgraphs by DPL (based on RVR viewgraphs)

Problems

7.1

Ex 6.1 of the lecture note

7.2

Ex 6.2 of the lecture note